LG Electronics

B1300

SERVICE MANUAL

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Chapter 1. Performance

1-1 Performance

Item	Description	Specification
1	Frequency Band	EGSM900 band Tx: 890 + n*0.2 MHz Rx: 935 + n*0.2 MHz (n = 0 ˜ 124) Tx: 890 + (n−1024)*0.2 MHz Rx: 935 +(n−1024)*0.2 MHz (n = 975 ˜ 1023) GSM1800 band Tx: 1710 + (n−512)*0.2 Rx: 1805 + (n−512)*0.2 (n = 512 ˜ 885)
2	Phase error	RMS < 5 degrees Peak < 20 degrees
3	Frequency error	< 0.1ppm ~ =90 Hz (for GSM900) or 180 Hz (for GSM1800)
4	Power Level	GSM900 Control Level Power level Tolerance 5 33 dBm ±2dB 6 31 dBm ±3dB 7 29 dBm ±3dB 8 27 dBm ±3dB 9 25 dBm ±3dB 10 23 dBm ±3dB 11 21 dBm ±3dB 12 19 dBm ±3dB 13 17 dBm ±3dB 14 15 dBm ±3dB 15 13 dBm ±3dB 16 11 dBm ±5dB 17 9 dBm ±5dB 18 7 dBm ±5dB 19 5 dBm ±5dB

Item	Description	Specification	
4	Power Level	GSM1800 Control Level Power Level Tolerance 0 30 dBm ±2dB 1 28 dBm ±3dB 2 26 dBm ±3dB 3 24 dBm ±3dB 4 22 dBm ±3dB 5 20 dBm ±3dB 6 18 dBm ±3dB 7 16 dBm ±3dB 8 14 dBm ±3dB 9 12 dBm ±4dB 10 10 dBm ±4dB 11 8 dBm ±4dB 12 6 dBm ±4dB 13 4 dBm ±4dB 14 2 dBm ±5dB 15 0 dBm ±5dB	
5	Spectrum due to modulation	GSM900 Offset from Carrier (KHz). 100 200 250 400 600 ~ <1200 1200 ~ <1800 1800 ~ <3000 3000 ~ <6000 ≧6000 GSM1800 Offset from Carrier (KHz). 100 200 250 400 600 ~ <1200 1200 ~ <1800 1800 ~ <3000 3000 ~ <6000 ≧6000	Max. dBc +0.5 −30 −33 −60 −60 −60 −63 −65 −71 Max. dBc +0.5 −30 −33 −60 −60 −60 −65 −65 −73

Item	Description	Specification	
6	Spectrum due to switching transient	GSM900 Offset from Carrier (KHz). 400 600 1200 1800 - GSM1800 Offset from Carrier (KHz). 400 600 1200 1800	Max. dBm −19 −21 −21 −24 Max. dBm −22 −24 −24 −27
7	Spurious emissions	Conduction, Emission Status, Appendix 1 Conduction, Emission Status, Appendix 2	
8	Bit Error Rate	GSM900 BER(Class II) <2.439% @−102dBm DCS1800 BER(Class II) <2.439% @−102dBm	
9	Rx Level Report accuracy	GSM900 GSM1800 >= −88 >= −86 2 2 >= −101 >= −99 3 2 < −101 < −99 4 2	
10	SLR	8 +/− 3 dB	
11	Sending Response	Frequency(Hz) Max.(dB) Min.(dB) 100 −12 200 0 300 0 −12 1,000 0 −6 2,000 4 −6 3,000 4 −6 3,400 4 −9 4,000 0	
12	RLR	2 +/− 3 dB	

Item	Description	Specification
13	Receiving Response	Frequency(Hz)　Max.(dB)　Min.(dB) 　100　　　　−12 　200　　　　0 　300　　　　2　　　　−7 　500　　　　*　　　　−5 1,000　　　　0　　　　−5 3,000　　　　2　　　　−5 3,400　　　　2　　　　−10 4,000　　　　2 * Mean that Adopt a straight line in between 300Hz& 1,000Hz to be Max. level in the range.
14	STMR	13 +/− 5 dB
15	Stability Margin	> 6 dB
16	Distortion	dB to ARL (dB)　　Level Ratio (dB) 　−35　　　　　　17.5 　−30　　　　　　22.5 　−20　　　　　　30.7 　−10　　　　　　33.3 　　0　　　　　　33.7 　　7　　　　　　31.7 　10　　　　　　25.5
17	Side tone Distortion	Three stage distortion < 10%
18	<Change>System frequency (13MHz) tolerance	≦ 2.5ppm
19	<Change>32.768KHz tolerance	≦ 30ppm
20	Power consumption	Full power: < 280mA (GSM) ; 　　　　　　< 220mA (DCS) Standby : Normal : <=5mA
21	Talk time	GSM/ Level_7 (Battery Capacity 720mA): 180Min

Item	Description	Specification
22	Standby time	Under conditions, at least 150 hours: 1.Brand new and full 720mAh battery 2.Full charge, keep GSM in idle mode 3.Broadcast set off. 4.Signal strength=-82dBm, DRX=9multiframes 5.Back light of phone set off, no press keypad
23	Ringer Volume	At least 90dB under below conditions: 1. Ringer set as ringer 7. 2. Test distance set as 10 cm
24	Charge Voltage	Fast Charge: < 720 Ma Trickle Charge: < 35 mA
25	Antenna display	Level (RSSI) 0 RSSI<=-104 1 -103<=RSSI<= -98 2 -97 <=RSSI<= -92 3 -91 <=RSSI<= -86 4 -85 <=RSSI<= -76 5 -75 <=RSSI
26	Battery indicator	Level (RSSI) 0 $3.300 \leqq V \leqq 3.504$ 1 $3.504 \leqq V \leqq 3.570$ 2 $3.570 \leqq V \leqq 3.686$ 3 $3.686 \leqq V \leqq 3.935$ 4 $3.935 \leqq V$
27	Low Voltage Warning	3.504V
28	Forced shut down Voltage	3.35V
29	Battery Type	1 Li-Ion battery Standard Voltage = 3.7V Battery full charge voltage =4.2V Capacity: 720mAh (Li-Ion);

| Item	Description	Specification
30	Travel Charger	**Linear Charger** In put: 110V or 220 VAC, 50/60Hz Out put: 5VDC+/−0.25V, 500mA (No Load) **Switching−mode charger** In put: 96− 246VAC, 50/60Hz Out put: 5VDC+/−0.25V, 500mA (No Load)

1-2 HW Feature

| Item	Feature	Comment
Battery	Li-Ion Battery, 720mAh	
AVG TCVR current (mA)	GSM Imax(280mA),DCS Imax(220mA)	
Stand by current (mA)	<=5mA	
- Talk time - Stand by time - Charging time	3-hour (GSM Tx Level_7) TBD-hour(Paging Period:5 RSSI:-82dBm) 2-hour	
RX sensitivity	GSM:-107dBm, DCS:-105dBm	
TX output power	GSM (Level 5:32dBm), DCS (Level0: 29.5dBm)	
GPRS compatibility	N/A	
SIM card type	3v/5v small	
Display	128x64	
Status Indicator	Soft Icons	
Keypad	0-9, #, *, C, Phone Book,up/down, On/Off Hook	
ANT	Internal	
System connector	Yes	
Ear Phone Jack	N/A	
PC synchronization	N/A	
Memory	2MB	
Speech coding	EFR/FR/HR	
Data & Fax	N/A	
Vibrator	Yes	
Melody	15 default + 5 user edit	
Voice Recording	N/A	
C-Mike	N/A	
Receiver	Yes	
Speaker Phone	Yes	
Portable Handsfree	Yes, option	
Travel Adapter	Yes	Switching
Options		

Chapter 2. Technical Brief

Circuit Description

2-1 The RF Chipset

The B1300 RF integrates the TRF6150 transceiver IC, TX/RX VCO, Power amplifier (RF3110), Front End Module 8450T(switchplexer, RF-SAW filter), for dualband transmitting and receiving function.
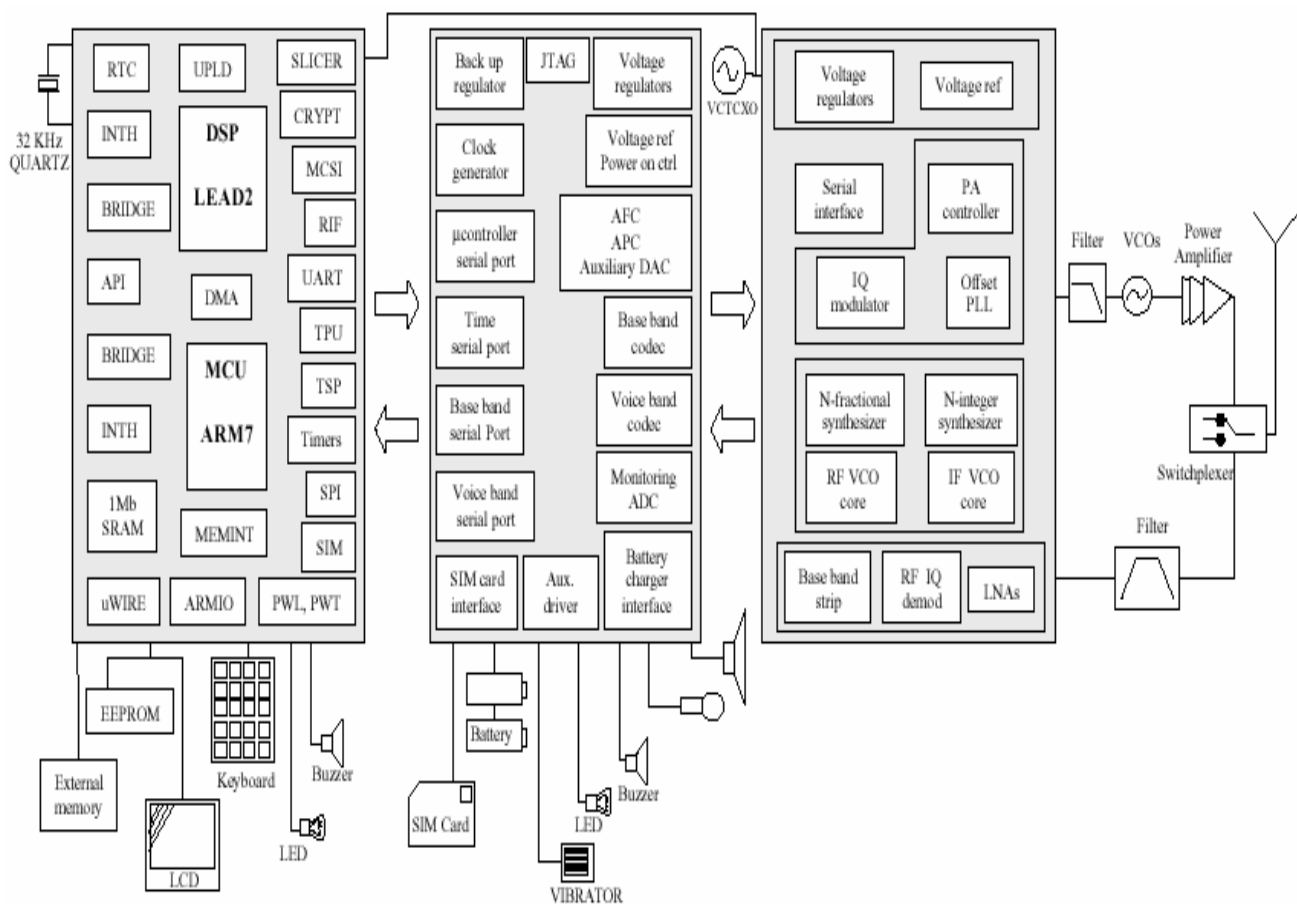
2-1-1 The Receiver
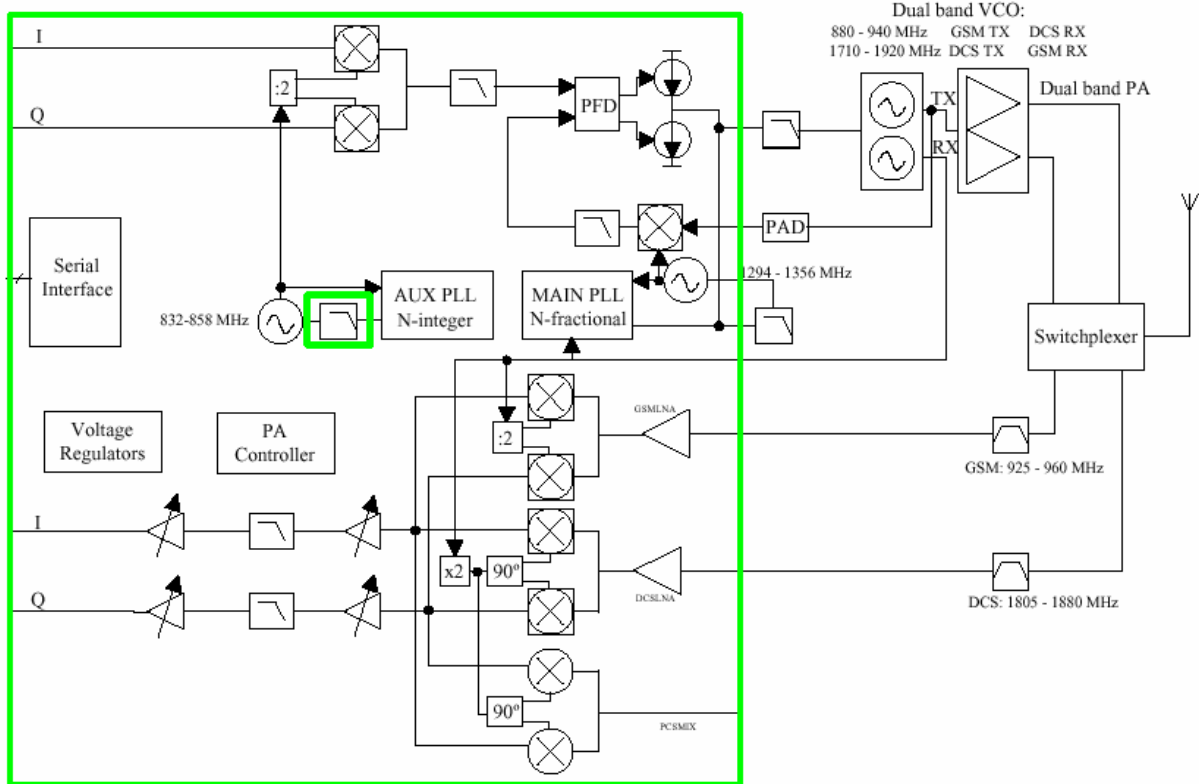
The RF receive signal(EGSM 925Mhz – 960MHz, DCS 1805Mhz – 1880Mhz) is input via the antenna or coaxial connector. An antenna matching circuit is between the antenna and the connector.
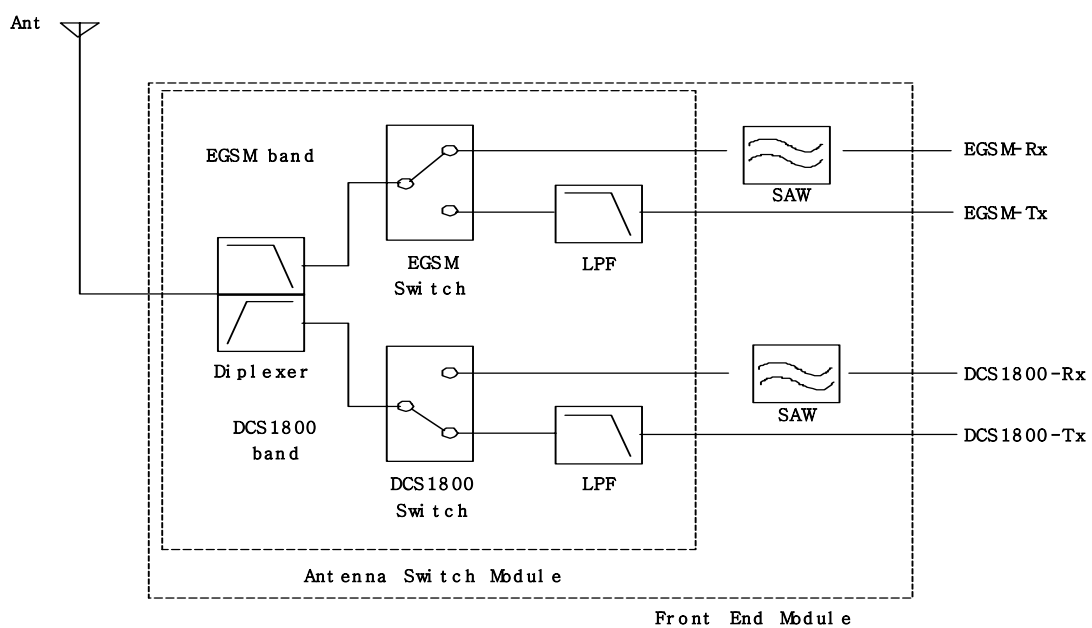
The RF receive signal(EGSM 925Mhz – 960MHz, DCS 1805Mhz – 1880Mhz) is input via the antenna or coaxial connector. An antenna matching circuit is between the antenna and the connector.

Module(FEM8450T) to switch either Rx or Tx path on. When the Rx path is turned on, the RF receive signal then feeds into two paths, EGSM Rx and DCS1800 Rx.

This Front End Module contains two RF SAW filters, DCS SAW Filter to filter any unwanted signal apart from the DCS Rx band. And the GSM SAW filter in the Front End Module is to filter out unwanted signal beyond the GSM Rx band. These two paths are then connected to the GSMLNA and DCSLNA of TRF6150 respectively.

The RF receive signal is amplified by LNAs in TRF6150, and then the signal then feeds into quadrature demodulator for mixing with LO which is produced by the main synthesiser of TRF6150 and external TX/RX VCO. TX/RX VCO will generate 2 times of RX frequency in EGSM band and half times of RX frequency in DCS band to minimize the DC offset generated by self mixing.

In TRF6150, the quadrature demodulator produce baseband(I/Q) signal .
This I/Q signal is amplified by two variable gain amplifiers and filtered by low pass filter, and then fed to baseband IC in differential mode.

2–1–2 The TX IF Modulator

The TX I & Q signals from baseband IC are fed to Pin#18-21 of the TRF6150, where they are then modulated onto a TX IF by the modulator inside TRF6150. The TX IF frequency is listed as below.

EGSM Band

From	To	AUX VCO= 2 x IF Frequency
CH 1	CH 26	858 MHz
CH 27	CH 43	852.8 MHz
CH 44	CH 91	858 MHz
CH 92	CH 108	842.4 MHz
CH 109	CH 985	858 MHz
CH 986	CH 1002	842.4 MHz
CH 1003	CH 1024	858 MHz

DCS Band

From	To	AUX VCO= 2 x IF Frequency
CH 512	CH 532	832 MHz
CH 533	CH 549	837.2 MHz
CH 550	CH 575	832 MHz
CH 576	CH 597	858 MHz
CH 598	CH 614	837.2 MHz
CH 615	CH 662	858 MHz
CH 663	CH 679	852.8 MHz
CH 680	CH 727	858 MHz
CH 728	CH 744	852.8 MHz
CH 745	CH 792	858 MHz
CH 793	CH 809	847.6 MHz
CH 810	CH 857	858 MHz
CH 858	CH 874	847.6 MHz
CH 875	CH 885	858 MHz

The signal TX LO IF (416 ~ 429Mhz) is produced by the AUX VCO (832 ~ 858MHz), which has been divided down by a factor of 2 .

2-1-3 The Translation Loop Transmitter

The translation loop approach has many advantages over a traditional upconverter solution.
A typical upconverter transmitter usually consists of an IF modulator followed by a mixer for
upconversion to RF. In the translation loop transmitter, the RF transmit signal is instead
generated directly by a voltage controlled oscillator (VCO), the phase of which is locked to
 the modulated IF reference in a fast phase-locked-loop. Because a VCO is inherently
a lower-noise source than a mixer, the translation loop transmitter produces a low noise floor,
so no subsequent high-selectivity filtering is necessary, and the diplexer or other post-PA filter
of the conventional approach is eliminated. This saves power and cost, as the insertion loss
of the duplexer is eliminated, and the output level of the power amplifier can be reduced.

The transmit signal is generated directly by a external TX/RX VCO (VON1885C28DKB).
In the feedback path, the RF transmit signal is mixed with the off-chip main VCO to produce
the desired TXIF (416 ~ 429Mhz). This TXIF signal from the feedback path is then compared
to the TXIF signal from the IF modulator at the detector. The resulting signal after passing
a low pass filter drives the external TX/RX VCO.

A high side injection, i.e. RF = LO - IF, is used in the EGSM band upconversion while a low
side injection, i.e. RF = LO + IF, is used in the DCS band upconversion.
This upconversion scheme, with appropriate TXIFs, allows for a single wide-band VCO to
be used.

2-2 The PA Circuit

The RF3110 is a triple-band GSM/DCS/PCS power amplifier module that incorporates an
indirect closed loop method of power control. This simplifies the phone design by eliminating
the need for the complicated control loop design. The indirect closed loop is fully self
contained and required does not require loop optimization. It can be driven directly from the
DAC out-put in the baseband circuit.
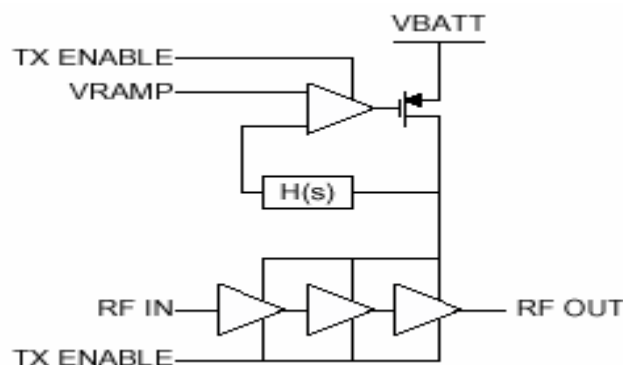
The indirect closed loop is essentially a closed loop method of power control that is invisible
to the user. Most power control systems in GSM sense either for-ward power or collector/
drain current. The RF3110 does not use a power detector. A high-speed control loop is
incorporated to regulate the collector voltages of the amplifier while the stages are held at a
constant bias. The V RAMP signal is multiplied and the collector voltages are regulated to
the multiplied V RAMP voltage.

Temperature Sensor

When the chip is not transmitting or receiving, its temperature can be measured by sensing the voltage on the external resistor from pin 31 to ground.
From −40 to +85 C, the resistor voltage varies linearly from 0.9V to 1.35V.

Regulator and Serial Data Interface

TRF6150 built in 3 voltage regulators to supply internal functions and external RF components. The serial interface of TRF6150 consists of a 3-wire serial bus, comprising DATA, CLOCK and STROBE signals. These signals are used to enter control words into the chip. The control words contain information for programming the regulators, the synthesizers and the receiver.

13 MHz Clock

The 13 MHz-clock consists of a TCXO (TOA1300VPM4DKG-SM2) which oscillates at a frequency of 13MHz. It acts as time base of all synthesizers and Baseband.

2-4 Digital Baseband Chip : HERCROM20, F741529

HERCROM20 is a chip implementing the digital baseband processing of a GSM mobile phone. It combines a TMS320C54X (LEAD2) DSP, a micro controller ARM7TDMIE, an internal 4Mbit RAM memory, and their associated application peripherals.

The HERCROM20 supports the following features:

• CPU & DSP
• Memory Interface (MEMINT)
• Interrupt Controller
• I2C / Micro Wire Interface
• Serial Port Interface (SPI)
• UART Control/Interface
• Display Interface
• SIM Card Interface

• I/O System Connector Interface
• Radio Interface (RIF)
• JTAG Interface
• Real Time Clock (RTC)
• General Timers / Watch Dog Timer
• Keypad Control
• Backlight Control
• Vibrator Control

System Block Diagram of Hercrom20
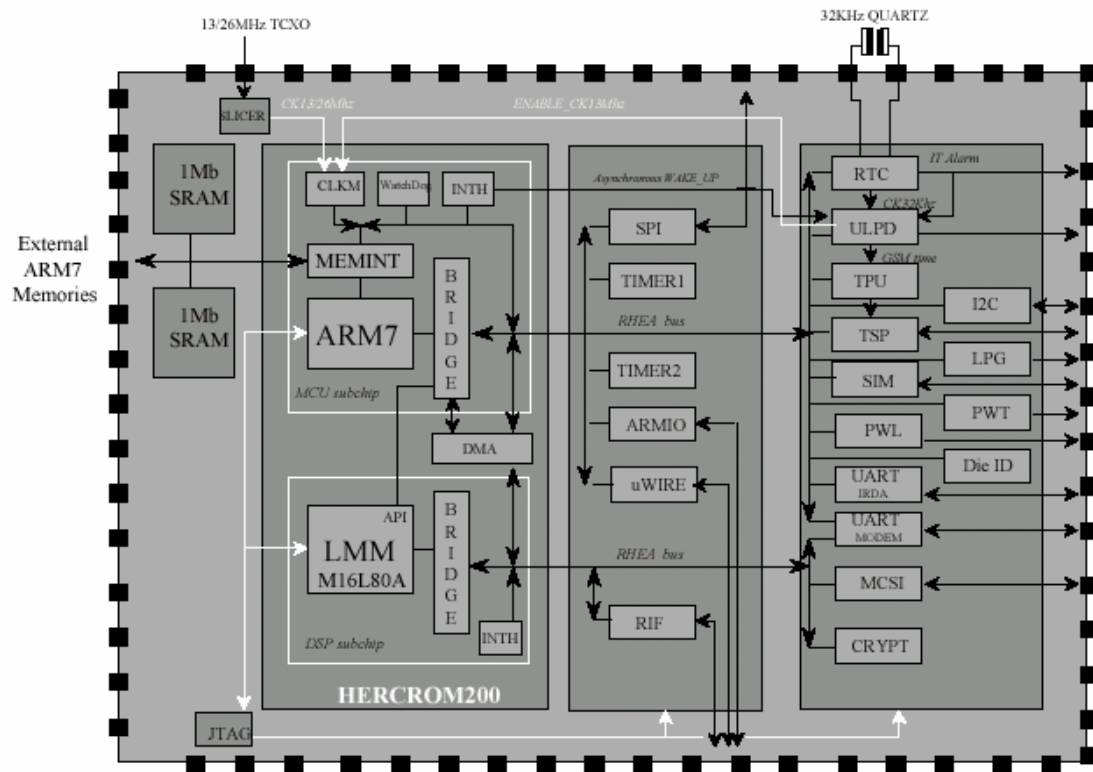
2-5 Analog Baseband Chip : Nausica_CS, TWL3012B

The TWL3012B device includes a complete set of baseband functions that perform the interface and processing of the following, voice signals, the baseband in-phase (I) and the quadrature (Q) signals, which support both the single-slot and multislot modes.
The TWL3012B device also includes associated auxiliary RF control features, supply voltage regulation, battery charging controls, and switch on/off system analysis.

The TWL3012B device supports the following features.
• Voiceband Coder / Decoder (codec)
• Baseband codec single and multislot with I/Q RF interface
• Automatic Power Control (APC) and Automatic Frequency Control (AFC)
• Voiceband Serial Port (VSP), Baseband Serial Port (BSP), and MCU Serial Port (USP),
  Timing Serial Port (TSP).
• SIM Card Interface
• Battery Charging Interface (BCI)
• Six Low-Dropout, Low-Noise, Linear Voltage Regulators (VREG)
• Voltage Reference and Power On Control (VRPC)
• Five-channel analog-to-digital converter (MADC)

System Block Diagram of Nausica_CS

LG Electronics
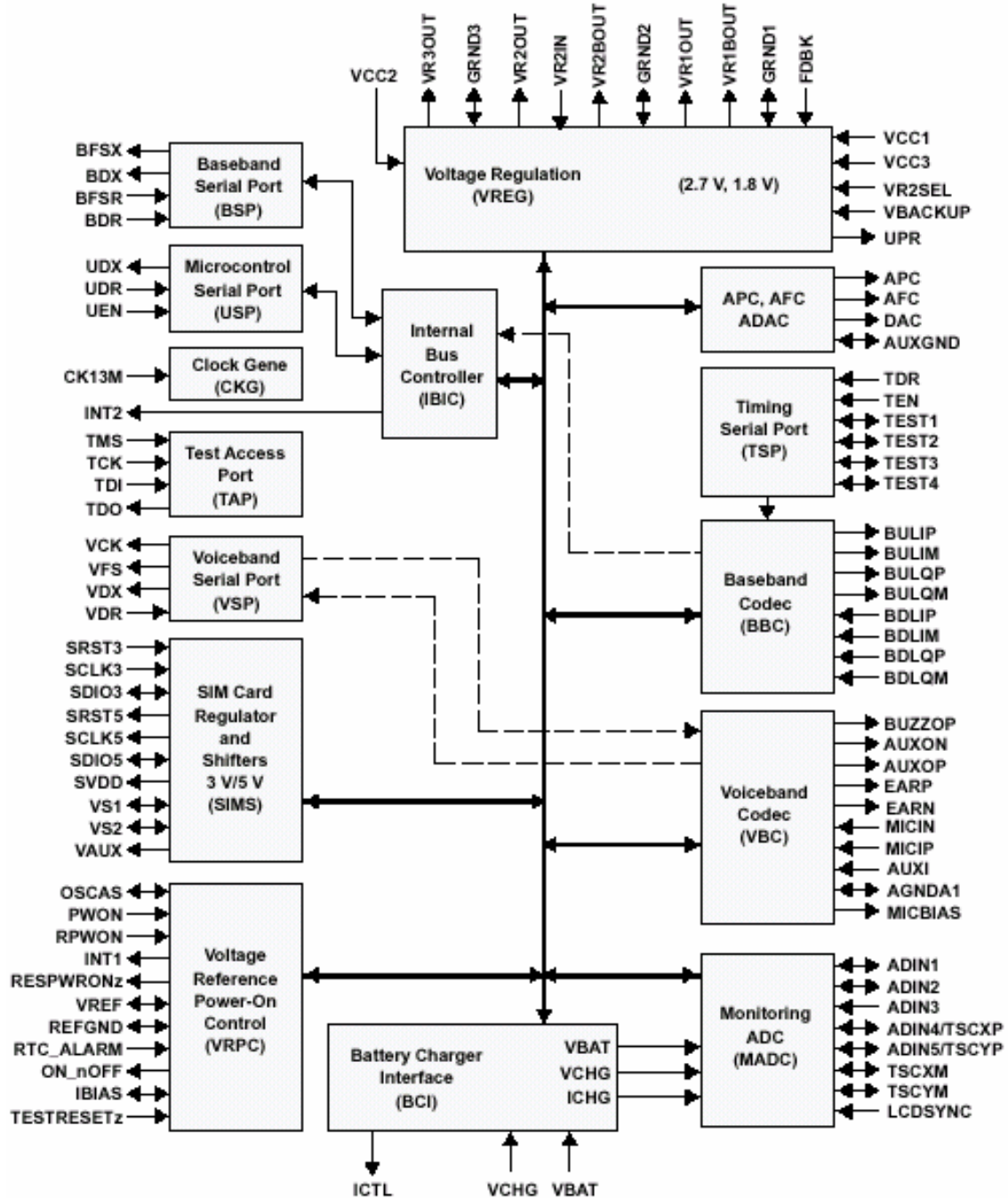
Peripheral

2-6 CPU Memories

Flash ROM

An 32Mbit programmable ROM which is capable of being written to while still in circuit.
Contains all the main command software for the mobile.

SRAM

A 4MBit SRAM memory is embedded in the HERCROM20 which is used for ARM7 & DSP execution

2-7 Power Supplies

There are six regulators in the Nausica_CS . Those regulators are dedicated power supplies, which provides most of the power requirements for the Baseband and RF circuits.
Each of these regulators can be controlled by Nausica_CS internal registers.
These are configured as shown in the following Figure and table.

Regulator	Voltage	Powers	Permanent
Regulator 1 VR1	1.8V+/-0.15	Digital Core & RTC	Permanent
Regulator 1B VR1B	2.0V+/-0.2	Nausica_CS Internal logic	On/Off
Regulator 2 VR2	2.9V+/-0.1	Memory device	Permanent
Regulator 2B VR2B	2.85V+/-0.15	Peripheral	Permanent
Regulator 3 VR3	2.85V+/-0.15	Nausica _CS analog supply	On/Off
SIM Regulator	3V+/-0.3 5V+/-0.5	SIM Card	On/Off

Table1. – Power Supply

Power supply

LG Electronics
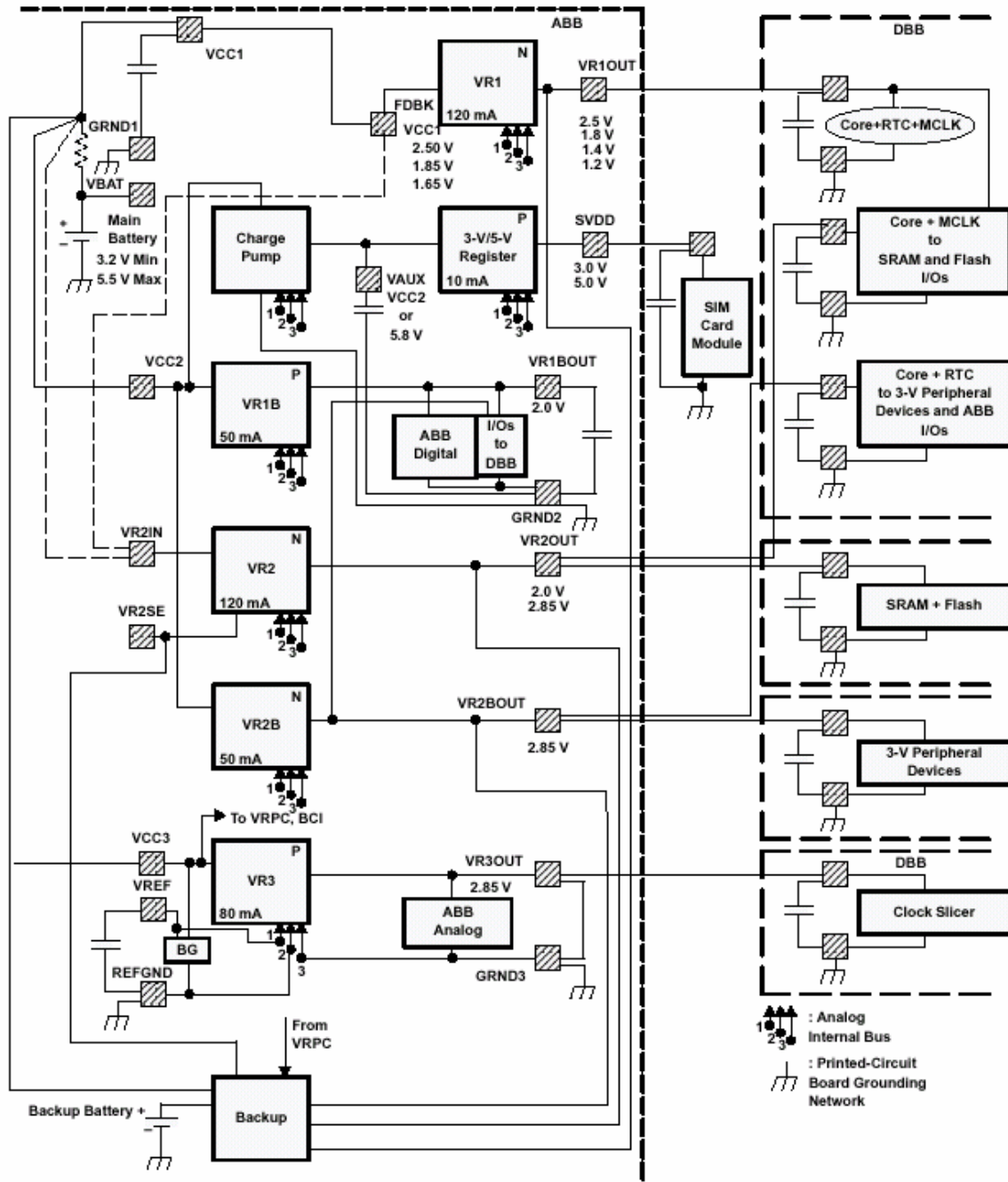
2-8 Battery Charge Interface

The charging device is a dc voltage source of 7 V absolute maximum. An external PMOS power transistor in series with a power Schottky diode connected between VCHG and VCC3 of the TWL3012B device controls the current flow from the charging device to the main battery. The role of the Schottky diode is to prevent reverse leakage current from the main battery in case the charging device is connected to the mobile phone without delivering any voltage at its output (charging device not plugged into the ac wall outlet, for example).

The main function of the battery charger interface is the charging control of both Ni-MH/Ni-Cd/Li-Ion cell battery with the support of the microcontroller. In case of a rechargeable backup battery, it also delivers a trickle charge current to the backup battery from the main battery. The charging scheme for the Li-Ion battery is constant current first (typical current is 1xC) followed by constant voltage charging once a certain voltage threshold is reached (4.2 V typical). Charging is stopped when the charging current at constant voltage has decreased down to C/20 (typical).

In addition to the above charging schemes, another scheme is systematically applied when a battery charger is connected to a switched-off mobile phone: a constant charging current (typically C/20) is applied to the battery when the battery voltage is lower than 3.6 V.

If the battery voltage is lower than 3.3 V (battery partially discharged or fully discharged) the mobile phone is not started until the battery gets sufficiently recharged to greater than 3.3 V; when this happens, the micro-controller is started to control the fast charge cycle of the main battery, and the C/20 current is switched off.

Battery Charge Control Circuit

•⊕▶ : Programming Bit from Microcontroller Interface
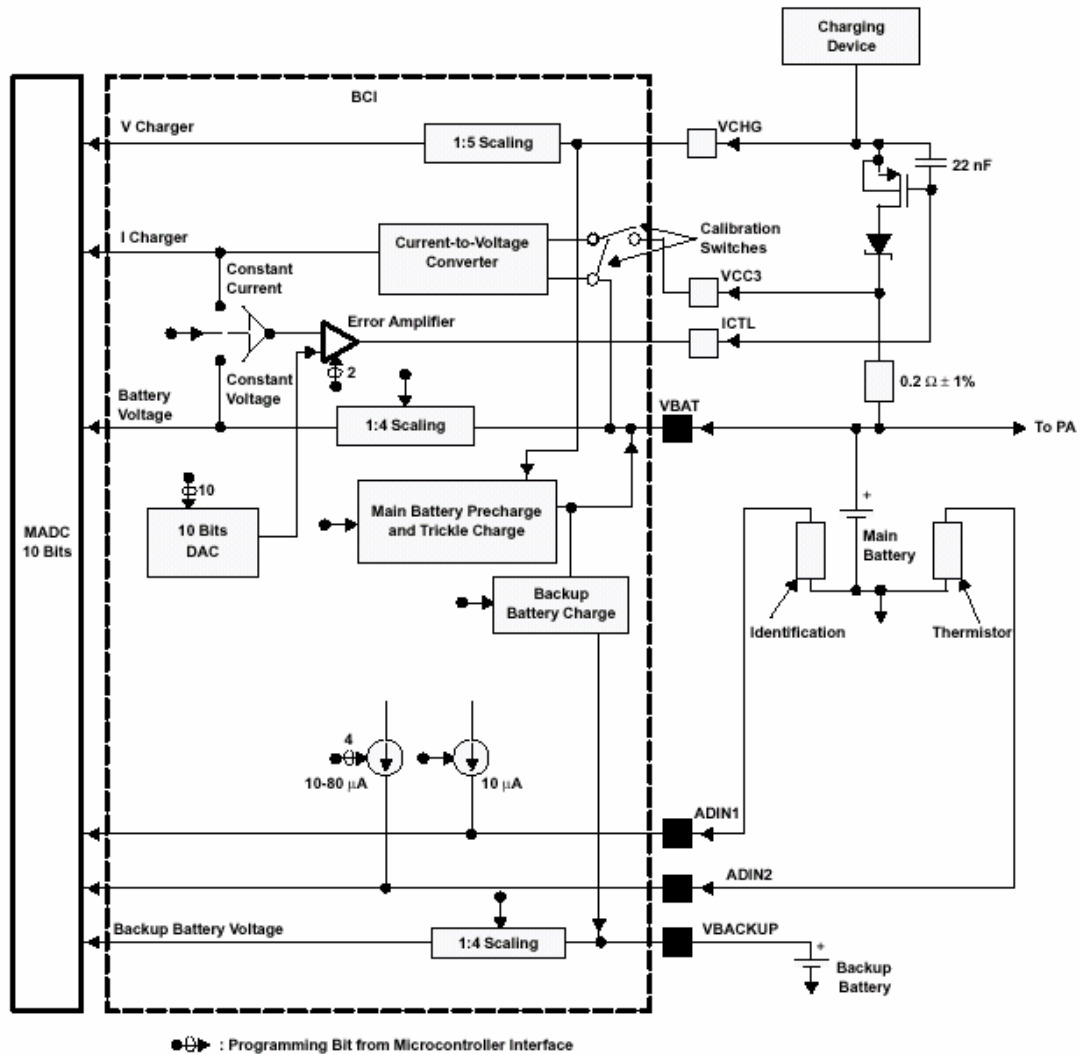
2-9 System Connector

This Connecter is for travel/desk charger, accessories connection and data access (trace, debug and Software Download).

System Connector Specification

Pin	Pin name	I/O	Pin Description
1	DSR / USC0	I	DSR (GPIO32) (DAI CLK /TCK)
2	USC1	I	GSPa_ RX / DAIRX / TDI
3	USC2	O	GSPa_TX / DAI TX /TDO
4	USC4 / USC3	O	GSPa_RTS (DAI FS/ TMS)
5	USC5	I	GSPa_CTS
6	Accessory	I	Accessory Detect / DAIReset
7	RX	I	SW Debug (UART2)
8	TX	O	SW Debug (UART2)
9	Headset SPK N	O	Auxiliary SPK N
10	Headset SPK P	O	Auxiliary SPK P
11	Headset MIC P	I	Auxiliary MIC P
12	Headset MIC N	I	Auxiliary MIC N
13	GND	G	Ground
14	GND	G	Ground
15	RPWRON	I	Remote Pwron
16	VCHARGE	I	Battery Charging Voltage(Charging)
17	VCHARGE	I	Battery Charging Voltage(Charging)
18	VBATT	O	Data Comm Supply Voltage
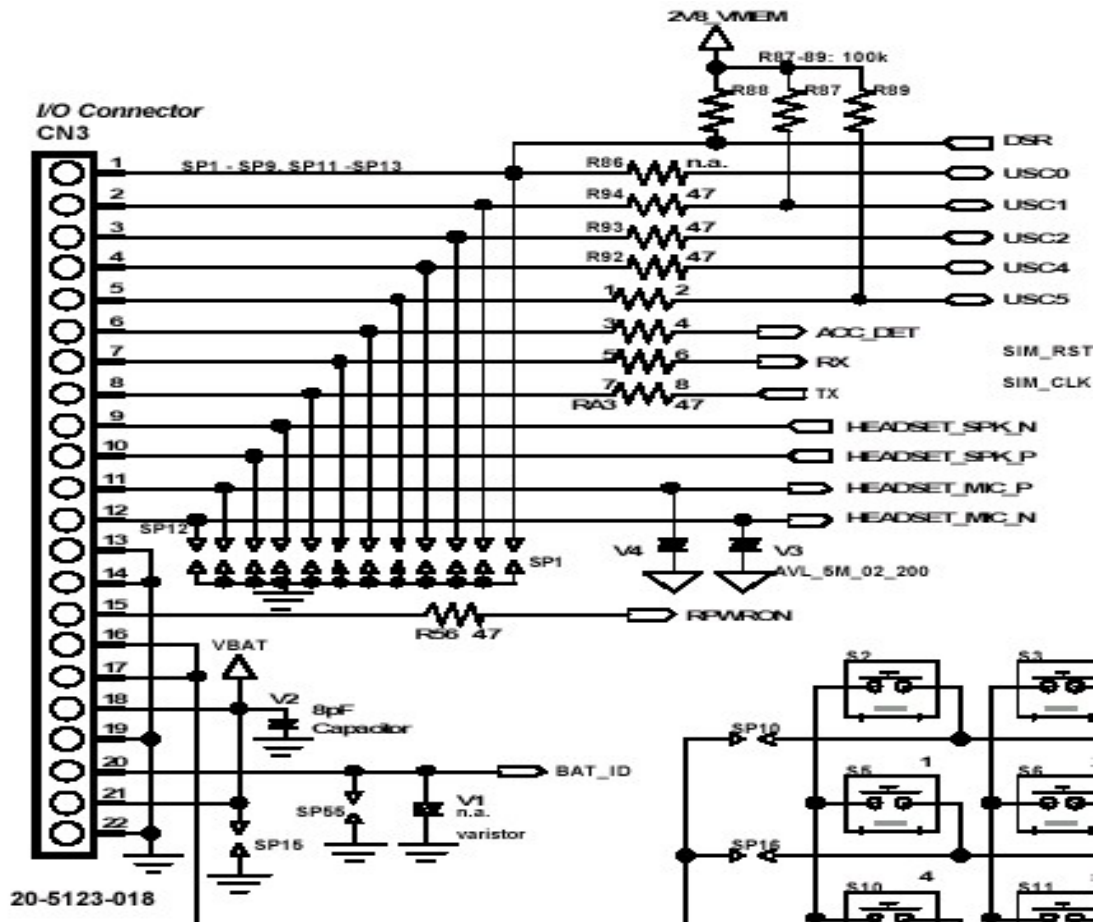
Please forget about pin 19 to 22 (External Battery Contact Pin)
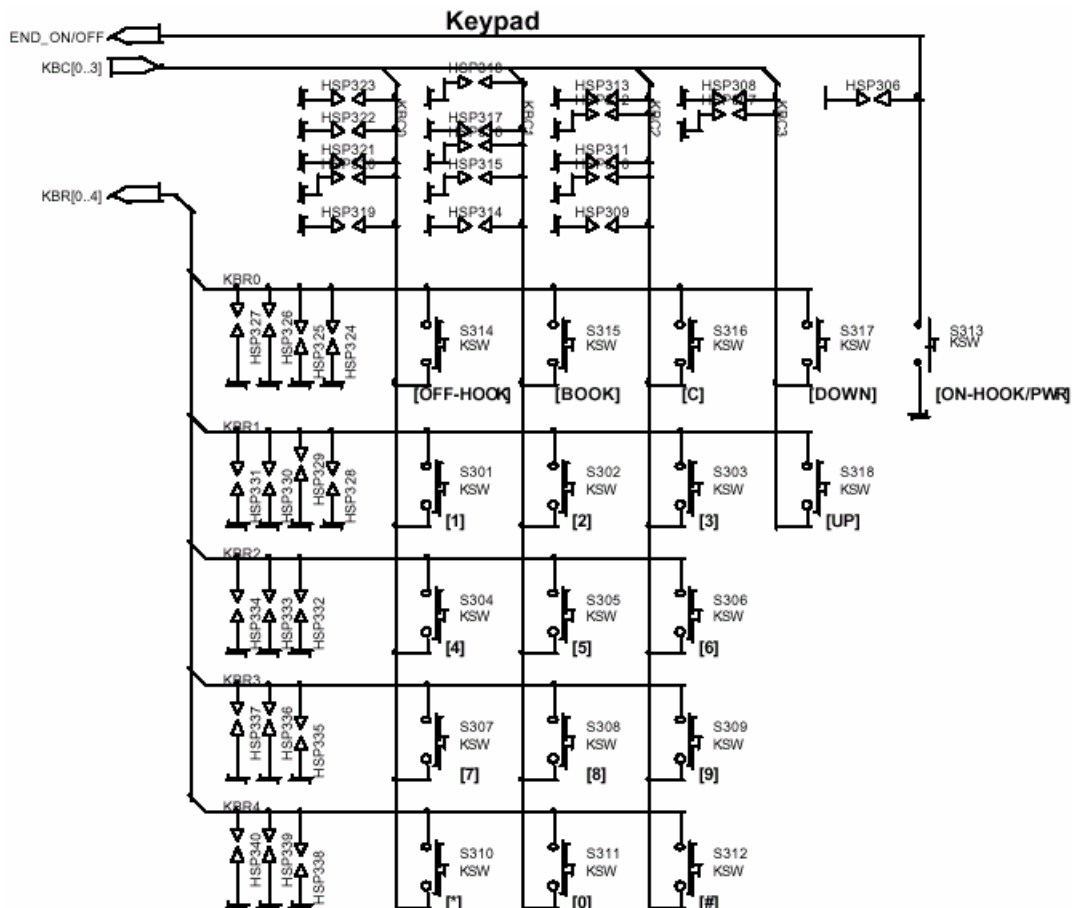
The key switches are metal domes which make contact between two concentric pads on the top layer of the PCB when pressed. There are 18 switches (S301-318), connected in a matrix of 5 rows by 4 columns, as shown in Figure, except for the power switch(S313) which is connected independently. Functions, the row and column lines of the keypad are connected to ports of Hercrom20. The rows are outputs with pull-up resistors embedded in chipset, while the columns are inputs. When a key is pressed, the corresponding row and column are connected together, causing the row output to go low and generate an interrupt. The columns/rows are then scanned by Hercrom20 to identify the pressed key.

LCD Display
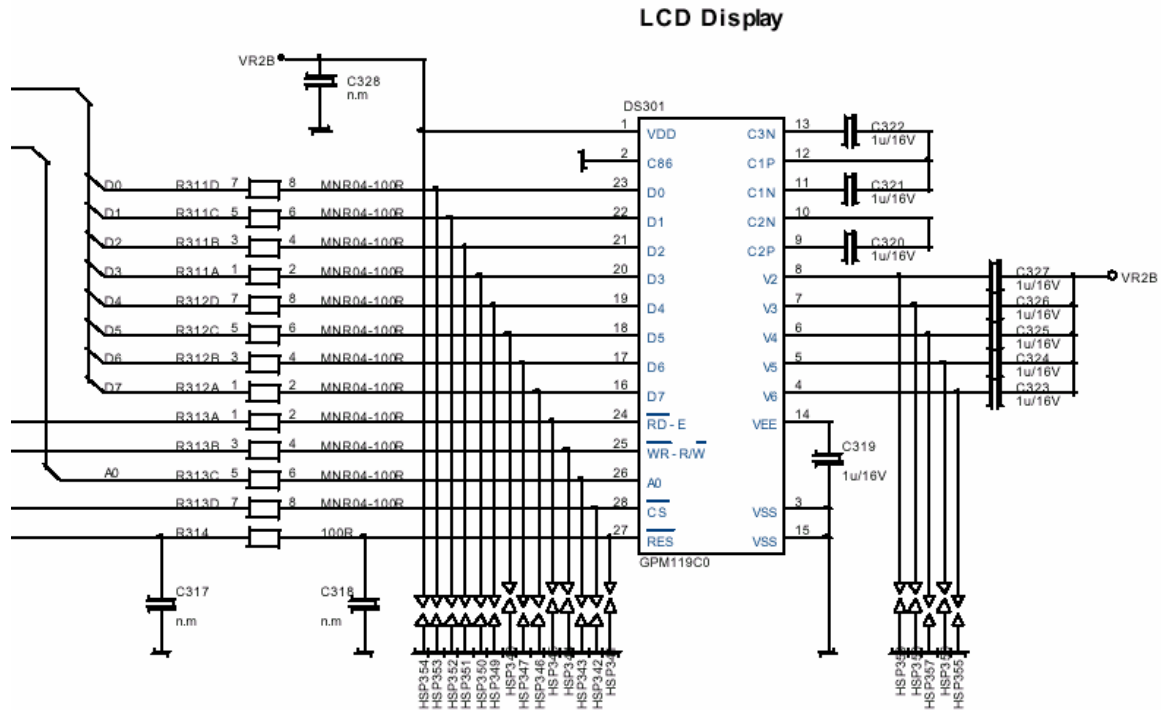
Power to the LCD is supplied by VR2B of Nausica_CS. The LCD can be reseted by RES. A low on this output reset the LCD. There is also the control output CS which is also derived from Hercrom20, this acts as the chip select enable for the LCD module. Hercrom20 uses data line D0-D7 to send serial data for displaying graphical text onto the LCD.

2-12 Microphone
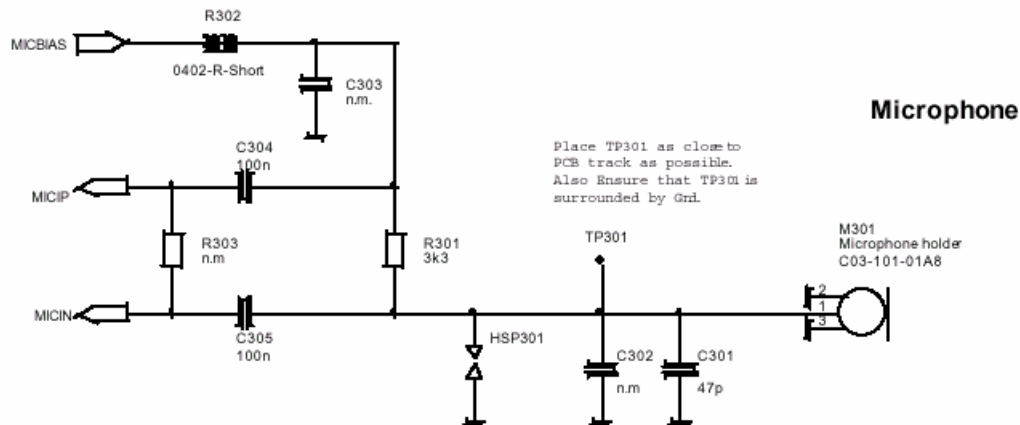
A microphone holder is mounted on PCB and is used to hold the microphone between frond cover and PCB. The audio signal is passed to the MICIN of Nausica_CS. The voltage supply MICBIAS is coming from Nausica_CS., and is a bias voltage for both the MICIP and AUDIO_ IN lines form system connector. The MICIN and AUDIO_IN signal is then A/D converted by the voiceband codec of Nausica_CS. The digitized speech is then passed to the DSP of Hercrom20 for processing (coding, interleaving etc.).

2-13 Receiver/Speaker/Buzzer
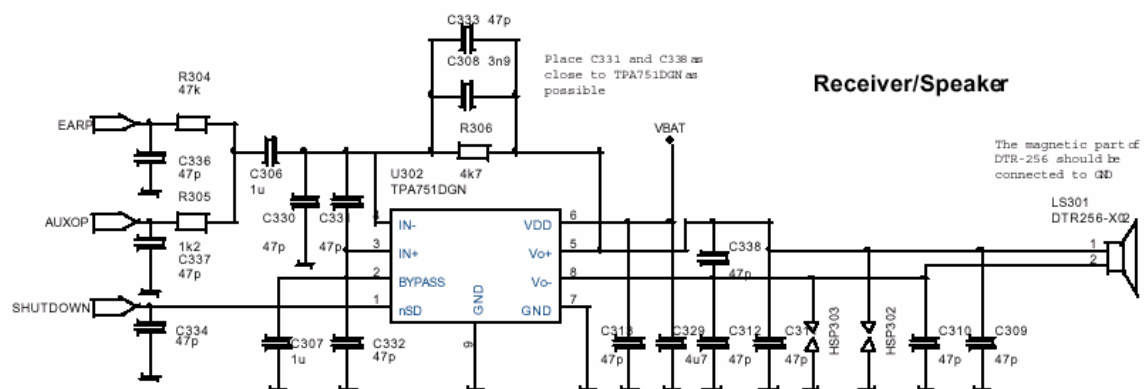
The low impedance speaker is driven by an audio amplifier. The audio amplifier is controlled by the SHUTDOWN pin form Hercrom20. In normal off-hook, the audio amplifier is turned on, when the headset is plugged in , the audio amplifier is turned off. When on-hook, the audio a mplifier is turned off for power saving.   There are two audio path (EARP & AUXOP) coming from Nausica_CS. In Receiver mode, the audio input is fed with EARP, In Speaker/Buzzer mode, the audio input is fed with AUXOP.

2-14 Headset Interface

The audio input of the headset is connected to AUXIN pin of Nausica_CS, the microphone is biased by MICBIAS pin form Nausica_CS, too.
The audio out to the headset kit is fed with EARN pin of Nausica_CS,

2-15 Back-light Illumination
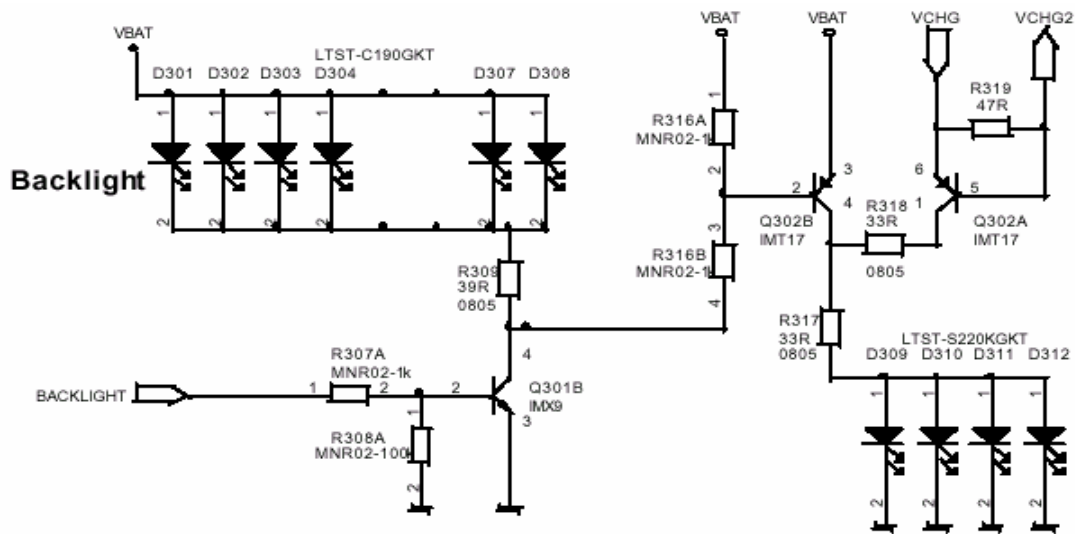
In Back-Light illumination, there are 10 Blue LEDs (six for keys and four for the LCD), which are driven by BACKLIGH line from Hercrom20. The purpose of Q302A, R319 and R318 is used for the indication of pre-charge.

2-16 Vibrator
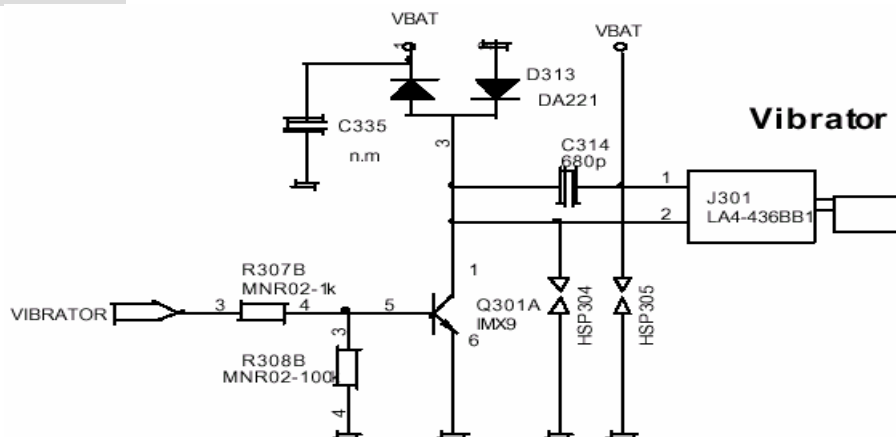
The vibrator is driven by the signal VIBRATOR, which is output from Hercrom20. The signal is amplified by the transistor Q301A (IMX9) and is supplied from Vbat.

Chapter 3. Failure List

FAILURE ITEM	L1	L2	L3
NO RING TONE		V	
RING TONE DISTORTION		V	
NO KEY TONE		V	
AUDIO NOISE	V	V	
POOR VOICE QUALITY	V	V	
LOW VOICE VOLUME	V	V	
RECEIVER / EARPIECE MUTE	V	V	
POOR HANDFREE VOICE QUILITY		V	
TOTALLY DEAD/NO POWER		V	V
UNEXPECTED POWER ON			V
UNEXPECTED POWER OFF/POWER OFF BY PLUG IN A EARPIECE			V
RANDOM TIME DISPLAY		V	
CLOCK RESET AT POMER ON /CLOCK DEAD		V	V
NO SERVE FOUND/NO NET WORK REGISTER			V
ROAMING AT POWER ON/UNEXPECTED INTERNATIONAL ROAMING			V
WRONG IMEI CODE			V
LCD NOT DISPLAY		V	
LCD DISPLAY MISSING ROW/LCD DISPLAY DETECT		V	
BLACK LCD		V	
FLICKING LCD DISPLAY / DISPLAY UNSTABLE		V	
BLACK LINE ON LCD DISPLAY		V	
RANDOM LCD DISPLAY		V	
LED FAIL		V	
WEAK SINGAL/ECHO IN TALKS			V
NO TRANSMIT / RECEIVE			V
ANTENNA DEFECT	V		
INCOME CALLS CAN'T BE PICKED UP			V
REMOTE SIDE AUDIO MUTE		V	V
SIGNAL INTERCEPT			V

FAILURE ITEM	L1	L2	L3
BAD CHARGER CONNECTOR		V	
CAN'T POWER ON AFTER CHARGING		V	V
SHORT WAITING HOURS		V	V
HIGH POWER CONSUMATION		V	V
BATTERY DAMAGE	V		
BATTERY CAN'T BE CHARGED	V		
BATTERY LEVEL DON'T DISPLAY			V
BATTERY LEVEL DISPLAY NOT CORRECT			V
INCOMPATIBLE WITH BATTERY	V		
SIM CARD UNRECOGNIZE		V	V
BAD SIM CARD CONTACT		V	
UNEXPECTED SIM CARD LOCK			V
HOUSING DAMAGE	V		
BAD KEYPAD RESPONSE	V	V	

Chapter 4. Trouble Shooting

4-1 Power Supply Failure

C223~
C227

U304

J104
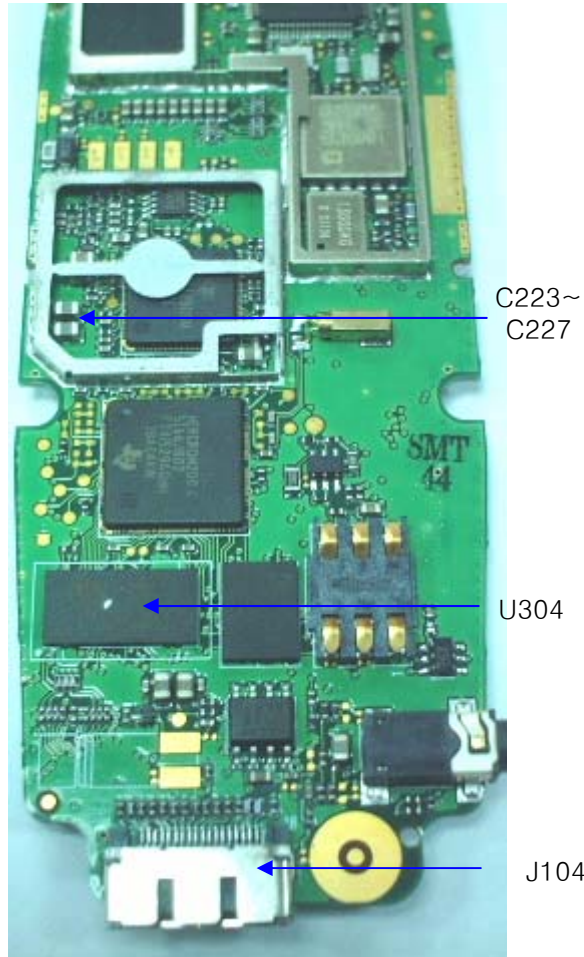
a) Failure :
- Problem with turning on mobile phone
Solution:
- Test the set's current by using battery
  simulator: observe the value of current
  used
- **Case 1:**
 If the Current is higher than 300mA,
 please check C223~C227, if short circuit,
 Replace it
- **Case 2:**
In the case the current is between 10
and 30mA, The cause could be FLASH
ROM(U304) defect, please use monitor
to re-install software. If the software can't
be re-install through serial port, use JTAG
interface to re-install software.

b) Failure :
- Problem with charging the battery
- Charging connector damage

Solution :
- J104 may be bad connection or broken,
  check the connector.
- J104 may be a cold soldering, Please
  re-solder again.
- If J104 is broken, replace the connector
  carefully
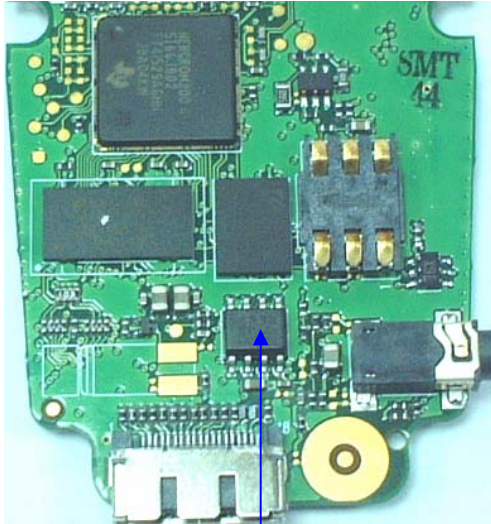
Q101

c) Failure :
- The value of the charging current look
   like short circuit.

Solution :
- Re-install the software
- Check Q101, if short circuit, replace it.

4-2 Software Download Failure
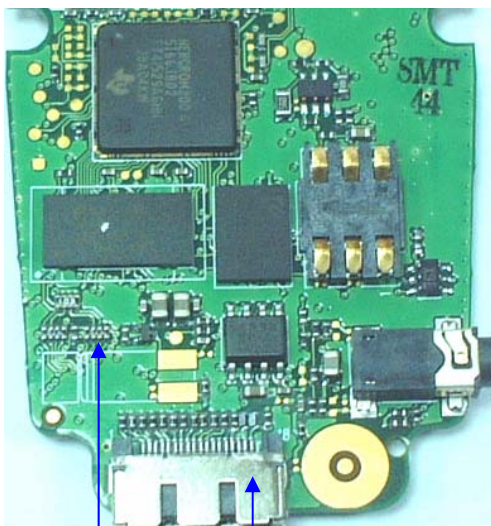
R109
R104   J104
R105

a) Failure :
- Problem with software download

Solution :
- J104 may be bad connection or broken,
 check the connector.
- J104 may be a cold soldering, Please
 re-solder again.
- Check R104,R105& R109, if cold
 soldering, Please re-solder again.

4-3 Voice Function Failure

R301

J104
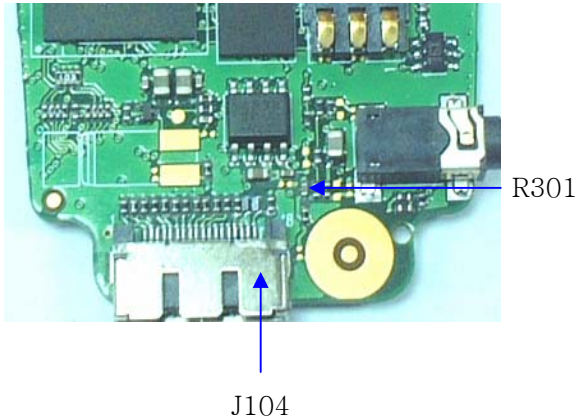
a) Failure :

-Microphone voice failure

Solution :

- Test the bias voltage on R301, it should
  be 2.5V,
- Replace Microphone, if bias voltage is fine.

MIC
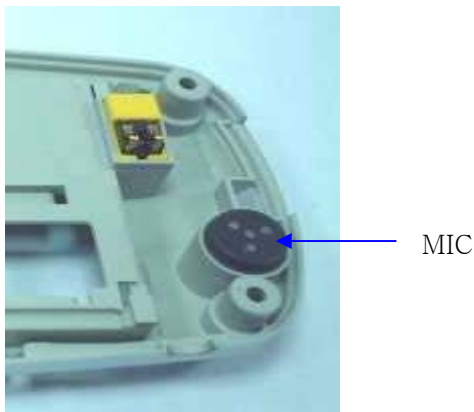
b) Failure :

-Speaker failure

Solution :

- Check speaker connector, it may be bad
  connection.
- Check U302 and related circuit, if short
  circuit, replace it.
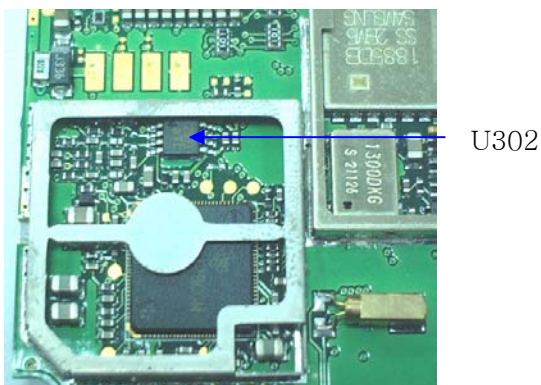
c) Failure :

- Headset function failure

Solution :

- J104 may be bad connection or broken,
  check the connector.
- J104 may be a cold soldering, Please
  re-solder again.
- If J104 is broken, replace the connector
  carefully

U302

4-4 Display Function Failure

LCD
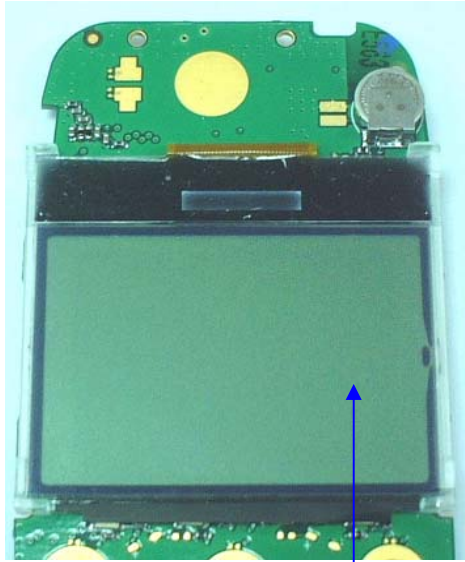
C319
~
C327

R311
~
R313

a) Failure :
-No display on LCD

Solution :
-Test the resistance of C319~C327 by
 using multi-meter, the value should be
 infinity. Replace the capacitor, which has
any impedance.
- Test the resistance of R311~R313, if cold
soldering, Please re-solder again.
-Otherwise, replace LCD module .

b) Failure :
- Broken LCD

Solution :
- Replace whole LCD module.
-Solder the LCD module with care.

c) Failure :
--Fails on dark display, black line, short of
 lines, unstable brightness

Solution :
- Test R311,~R313, if cold soldering,
 Please re-solder again.
- Test C319~C327, if cold soldering,
 Please re-solder again.
- Otherwise, Replace whole LCD module.
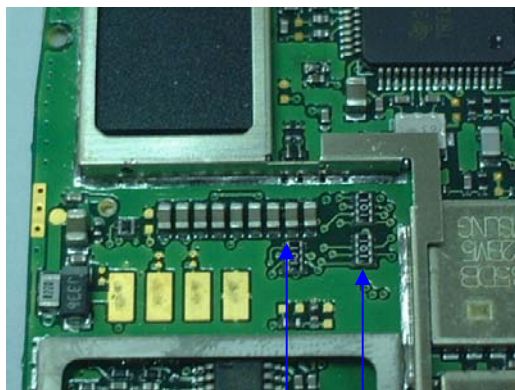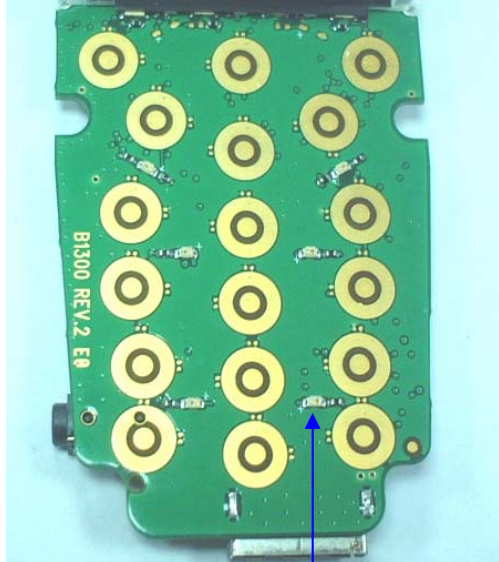
LED

d) Failure :
-No Back-light

Solution :
- Replace the LED that doesn't light up
  including any failing parts of LED.
- If all of the LED fails, Please check
  Q301, Q302 and related circuits.

Q302   Q301
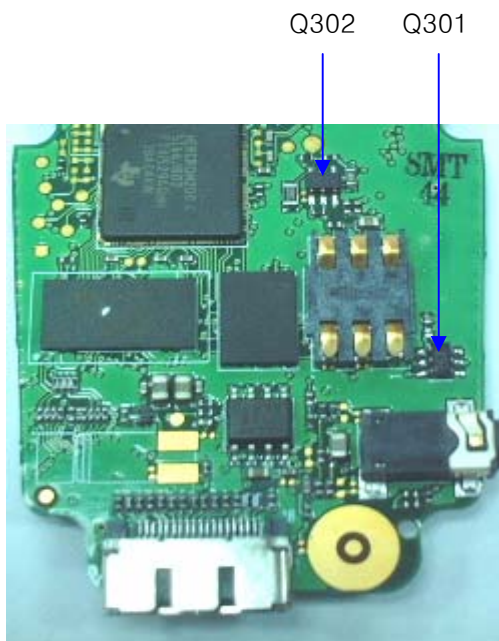
Chapter 5. Test Point Data

5-1 Component Side (1-1)
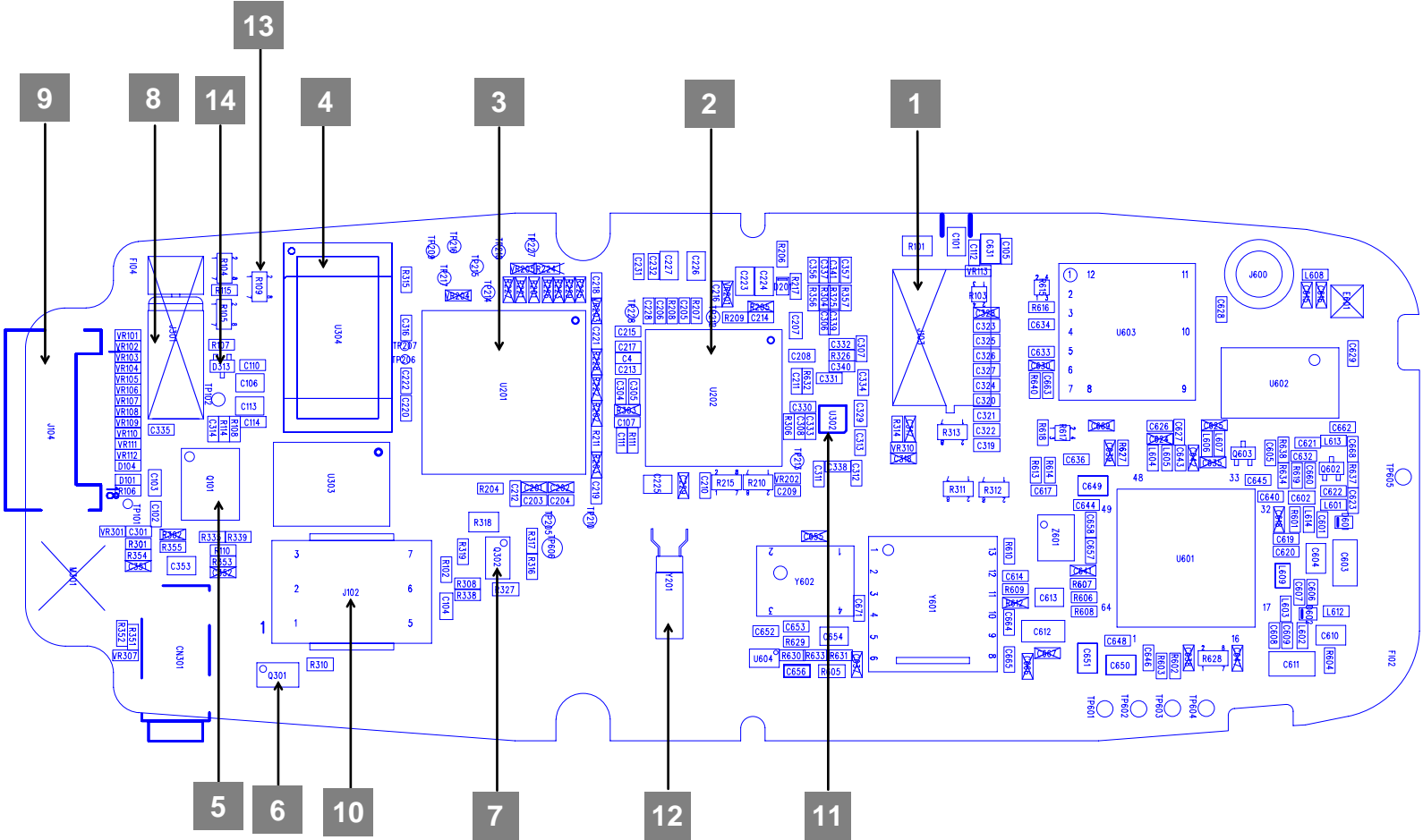
	Loca-tion	Component Side (1-1)
1	J103	Battery connector : For damage or cold soldering cause power on failure
2	U202	Nausica_CS : analog baseband chipset (ABB)
3	U201	Hercrom20 : digital baseband chipset (DBB)
4	U304	16Mbit flash ROM : For damage or cold soldering cause power on failure
5	Q101	P-channel MOSFET with schottky diode : For damage or cold soldering Cause charger function failure
6	Q301	Isolated dual transistors : For damage or cold soldering Q301A cause vibration motor Failure, Q301B cause keypad back-light failure
7	Q302	Isolated dual transistors : For damage or cold soldering Q302A cause pre-charger indication failure, Q302B cause the LCD back-light failure
8	J301	Vibration motor : For damage or bad connection cause vibrator failure.
9	J104	System connector : For damage or cold soldering cause headset failure, trace/debug /SW download failure
10	J102	SIM connector : For damage or bad connection cause SIM card failure.
11	U302	Audio amplifier : For damage cause speaker function failure.
12	Y201	32.768kHz crystal : For damage cause RTC function failure.
13	R104 R105 R109	8P4R resistor network : For damage or cold soldering cause trace/debug /SW download failure
14	D313	Switching diode array : For damage or cold soldering cause the surge noise by Vibrator

5-2 Component Side (1-2)

-41-
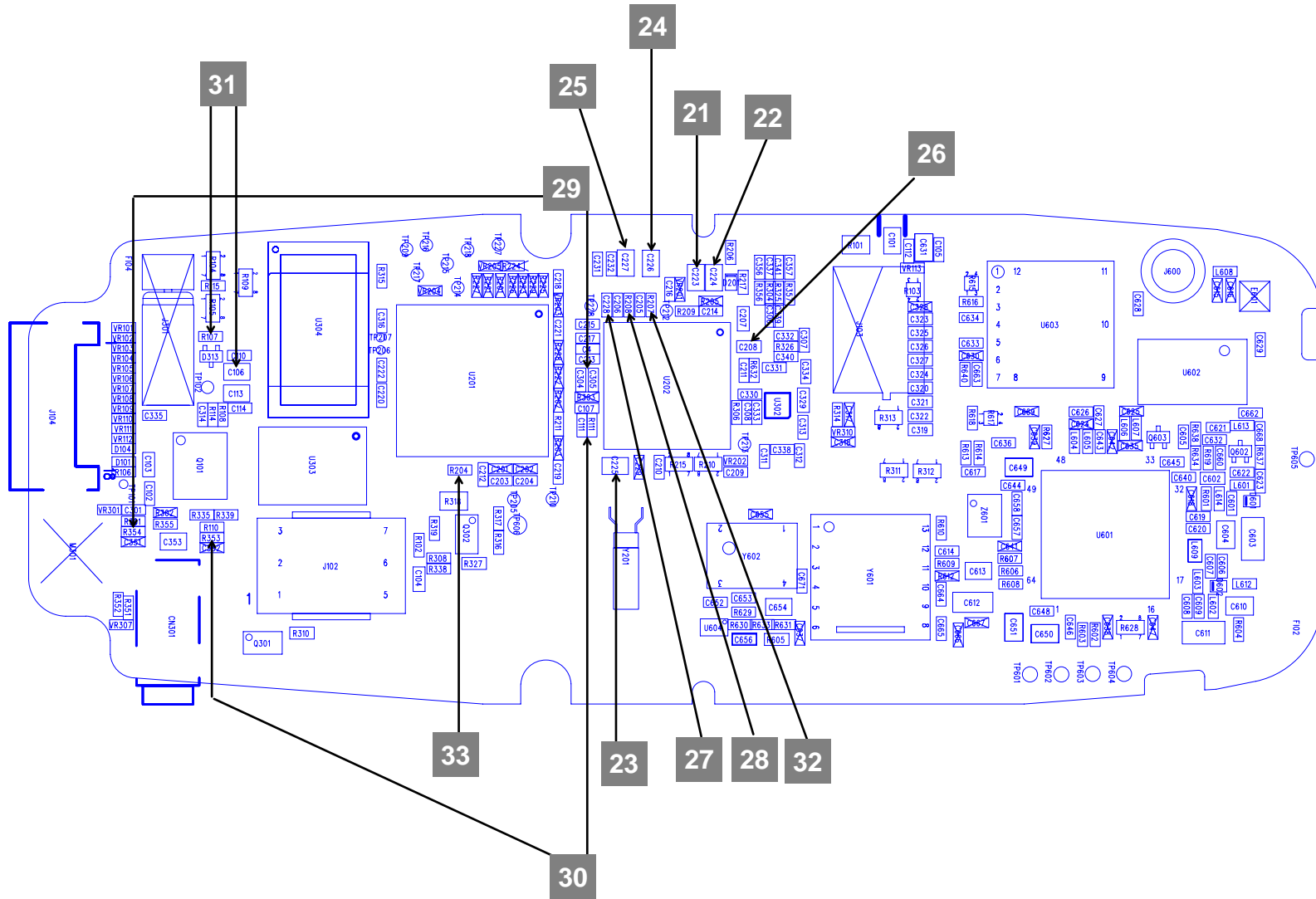
	Loca-tion	Component Side (1-2)
21	C223	VR2B regulator (2.85V) : For damage or cold soldering cause power supply for DBB & ABB peripheral failure.
22	C224	VR1B regulator (2V) : For damage or cold soldering cause power supply for ABB internal logic failure
23	C225	VR3 regulator (2.85V) : For damage or cold soldering cause power supply for ABB analog circuits failure
24	C226	VR2 regulator (2.9V) : For damage or cold soldering cause power supply for Memory device failure.
25	C227	VR1 regulator (1.8V) : For damage or cold soldering cause power supply for DBB Core & RTC failure
26	C207 C208	SIM regulator (3V/5V) : For damage or cold soldering cause power supply for SIM Interface failure
27	C206	VREF output (1.2V) : For damage or cold soldering cause power supply for power on failure
28	R208	IBIAS output : For damage or cold soldering cause power supply for Power on failure
29	R301 C304 C305	Microphone Input : For damage or cold soldering cause microphone failure
30	R110 C107	Ext. audio Input : For damage or cold soldering cause external audio input failure
31	C106 R107	Ext. audio output : For damage or cold soldering cause external audio output failure
32	R207 C205	ABB local Osc. generator : For damage or cold soldering cause ABB local Osc. failure
33	R204	SIM card power control : For damage or cold soldering cause SIM card power control failure.

5-3 Keypad Side (2-1)
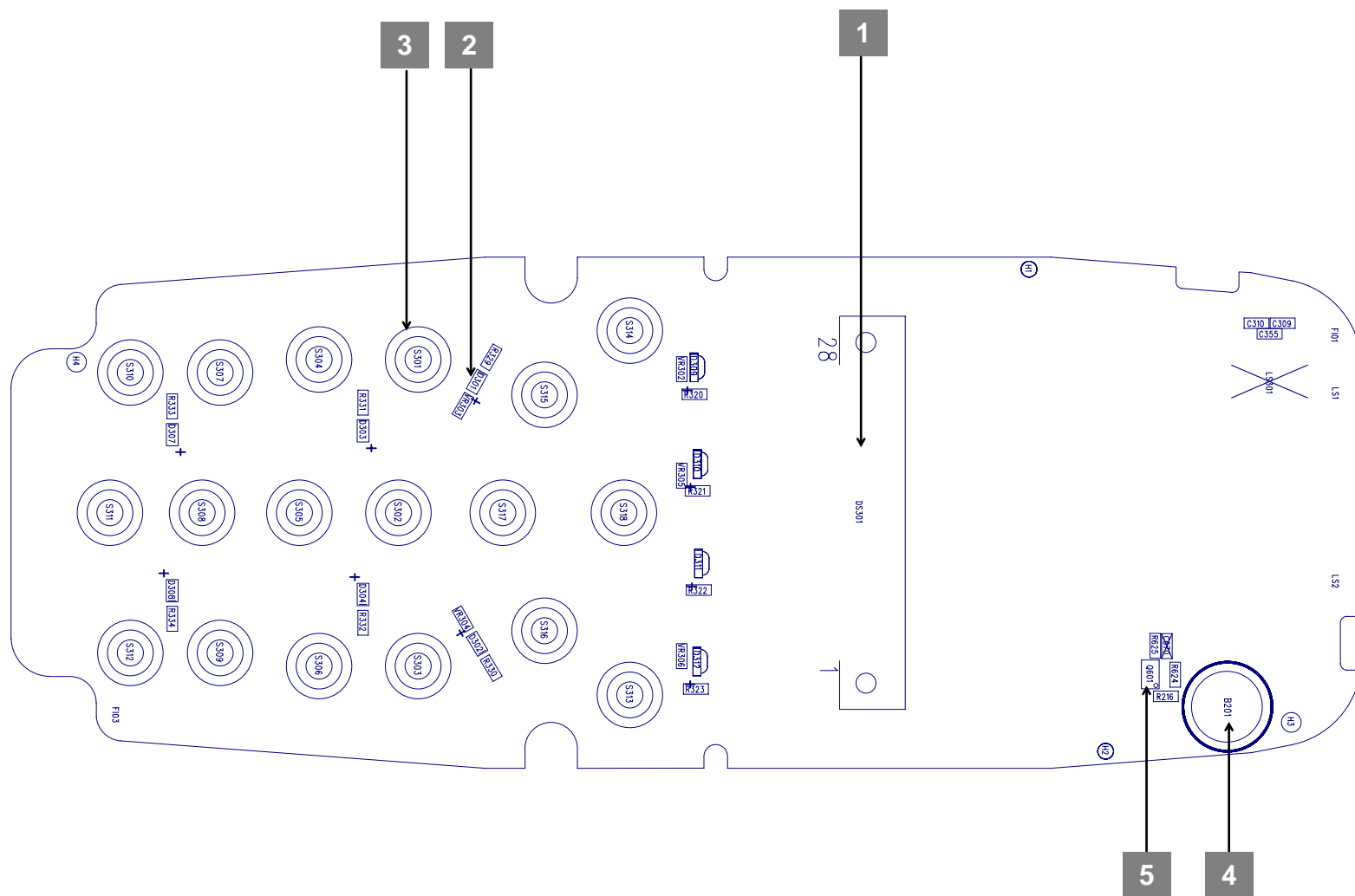
	Loca-tion	Keypad Side (2-1)
1	DS301	LCM Connector : For damage or cold soldering cause LCD Display failure
2	D301~ D312	Back-Light LED : For damage or cold soldering cause back-light LED failure
3	S301~ S317	Keypad Switches : For damage or shirt circuit cause keypad function failure
4	B201	Backup Batter: For damage or cold soldering cause RTC function failure
5	Q601	T/R Switch transistor : For damage or cold soldering cause T/R Switch function failure

Chapter 6. Assembly Instructions

1. Remove Battery Cover

2. Remove Battery

3. Remove Screws
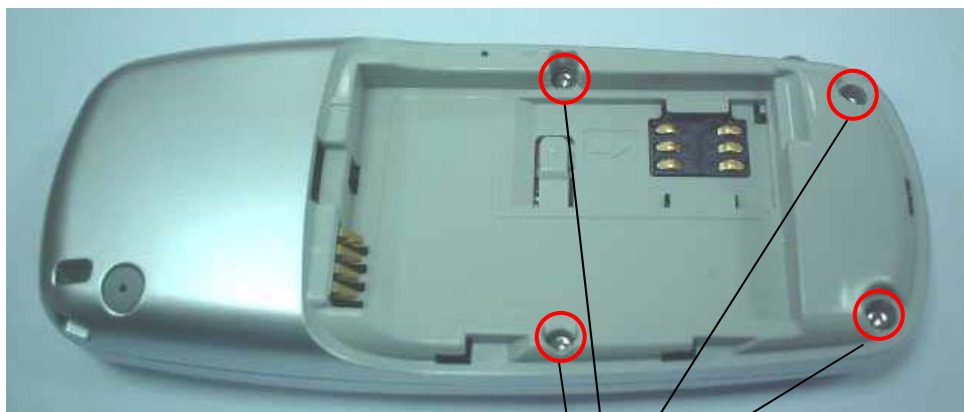
There are 4 screws in total

4. Turn Handset Up

5. Take off Front Panel

6. Take off Keypad & Metal-Dome
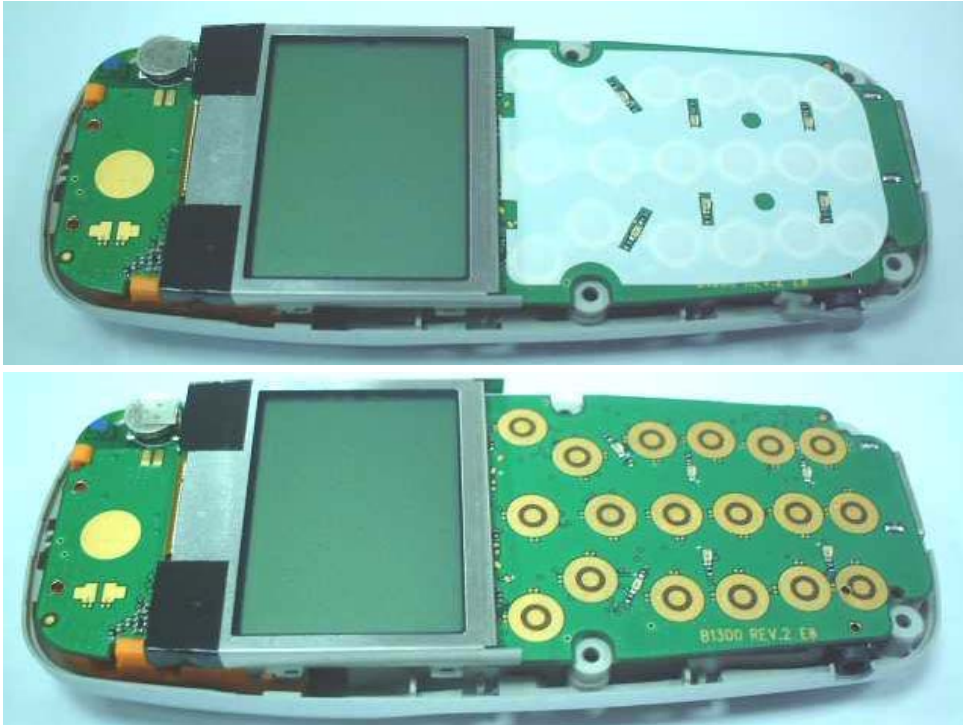
7. Take off Mainboard
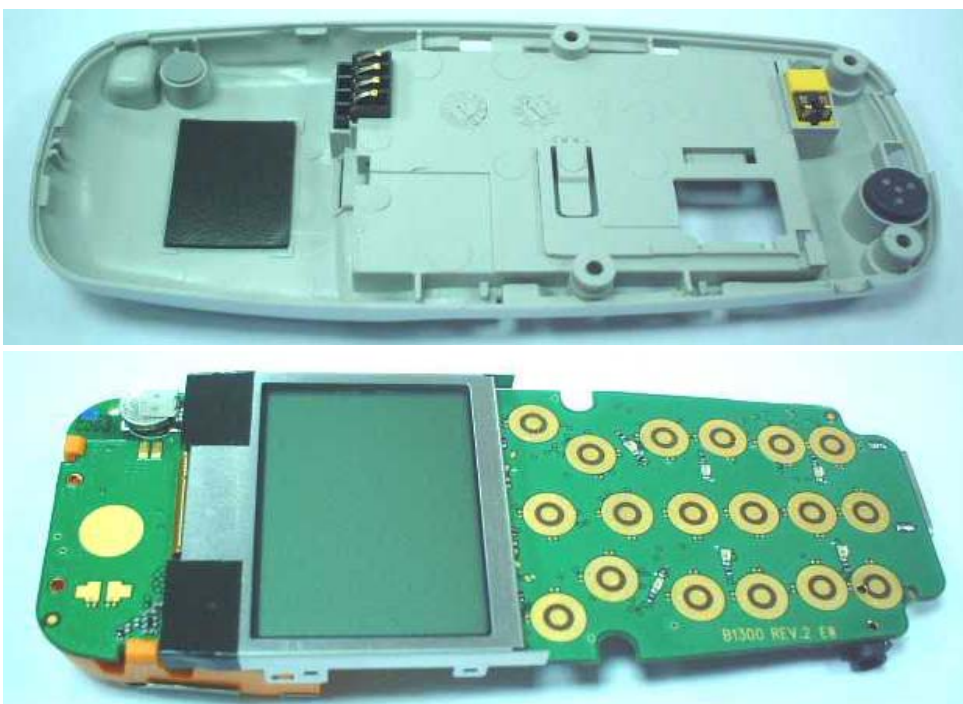
8. Take off Battery Connecter & MIC & Vibrator

| Battery Connecter | Vibrator | MIC |
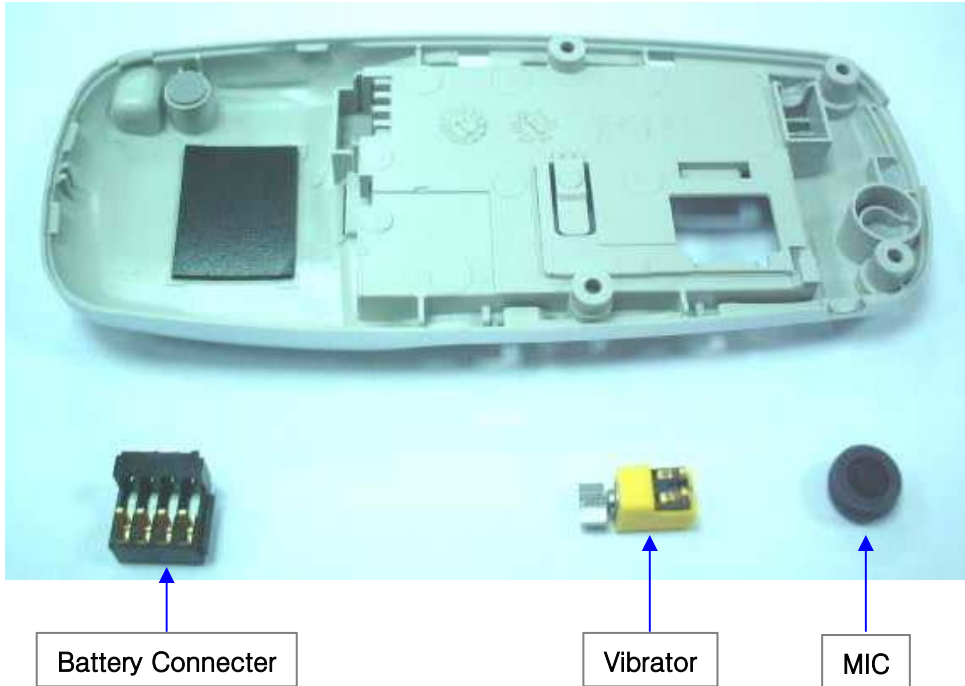
9. Turn Mainboard Down

10. Take off Antenna

11. Take off Shielding Cover

Chapter 7. Block Diagram

1. RF Section

LG Electronics

Block diagram showing HERCROM 20 (containing ARM 7 and C54X) and Nausica_CS (containing Codec and PM) connected to Flash, SRAM, LCD, Keypad, Vibrator, Backlight, System Connector, RF Interface, Microphone, Battery, Speaker, SIM, and Charger.

Chapter 8. Circuit Diagram

Baseband Chip-set

Baseband Peripheral

-56-

ULYSSE

HERCROM20

U201
ULYSSE_179uBGA_HERCROM20

Nausica

-57-

BaseBand supply overview :

Supply	Voltage	Description	Type
VR1	(1.8V)	Digital core & RTC	Permanent
VR1B	2.0V	Nova internal logic	ON/OFF
VR2	2.0/2.9V	Memory devices	Permanent
VR2B	2.9V	Nova & Samson peripherals	Permanent
VR3	2.9V	Nova analog supply	ON/OFF

Microphone

Backlight

Receiver/Speaker

Keypad

Vibrator

LCD Display

LITEON Lite-On Technology Corp.

Title: B1300 Baseband Peripheral

Size A2 Document Number <Doc> Rev 2.2

Date: Wednesday, January 22, 2003 Sheet 1 of 1

Synthesizer

ACTIVE CIRCUITRY:

TX	Main PLL + Main VCO
	Aux PLL + Aux VCO
	Offset PLL + TX/RX VCO
RX	Main PLL + TX/RX VCO

Main VCO

Z601
LDB25D500A0013A

Transmitter

U601B
PTRF6150

TXVCO_ON

VRF2

VRF2

Q603 DTA114YE
47k
10k

R634 2k7

L613 100n

C668 27p   C662 100n

Q602 2SC5010

R601 220R

C601 5p6   C660 6p8

L614 6n8   R619 6k8

L601 2n7   C622 2p7

C602 1n   D601 HVC369B

C604 4n7-5% ECHU

C623 2p7

R637 100R   C632 5p

R638 68R

C605 27p

C621 27p

C657 33p

C658 33p

C603 33n-5% ECHU

R602 1k2   R603 680R

U601D PTRF6150

C637 n.m

VRF2

L603 120n

C608 100n   C609 68p

AUX VCO

R605 2k2   C653 1n

13 MHz

TCXOBUFEN
TCXOEN
AFC
13MHZ

R631 15R   C654 2u2

R633 15R   C656 1u

C655 n.m

Y602 TOA1300VPM4DKG-SM2

U604 SN74AHC1GU04DCKR

R629 1M

R630 560R

C652 1n

Main PLL
Aux PLL
Q-Mod
PFD/CP
I/Q

TXRXcp

R607 82R   C612 12n ECHU

R606 1k8   R608 3k3

C606 3p9   D602 HVC369B   L612 22n

L609 15n-LQP-type

C607 3p3   L602 120n

R604 2k2   C611 15n-5% ECHU

C610 2n2-5%

C613 1n, COG   C614 100p

R609 33R   R610 33R

C669 n.m

C665 120p   C666 n.m   C667 n.m   C664 n.m

VRF3

R612 0402-R-Short

C617 27p

C671 1p   R613 1k2   R614 1k5

Y601 VON1885C28DKB

TX/RX VCO

CTRL   Vcc

Low = GSM
High = PCN

TX_1800

TX_900

R616 6R8

R615A 680R   R615B 680R

R618 6R8

R617B 680R   R617A 680R

U603 RF3110

DCS_PCS_IN
GSM_IN

GND...

DCS_PCS_OUT 11
GSM_OUT 9

B_SW   PA_EN   VRAMP   VBATT   VREG   VCC2_GSM   VCC_OUT   VCC2_DCS_PCS

HSL1 STRIPLINE-inn

Transmitter

TP606

R640 1k   C663 680p

C636 22p   C631 4U7-X5R   C633 47p   C634 12p

VRF3   C630 n.m

Receiver

U601C PTRF6150

Main PLL

I/Q

DCS1nap
PCS1nap
GSM1nap
GND1nax

C620 1n   C619 1n   C618 1n

L604 1n8   12p C626

L605 1n8   C624 n.m   C627 n.m   12p

L606 10n-5%   C625 n.m

L607 10n-5%   C635 n.m

Frontend

U602 FEM8450T

E601 ANT-PAD-2_0-LGH   TP605

J600 MS-147

ANT

L608 3.3nH

C615 n.m   C616 n.m

RX-900A   RX-900B   RX-1800A   RX-1800B   VCC1   VCC2

Switch	TX900	TX1800	RX900/RX1800
VCC1	2.8 V	0 V	0 V
VCC2	0 V	2.8 V	0 V

C628 47p   C629 12p

VRF3   Q601 Si1905DL

C670 n.m   R624 47k

R625 47k

VRF3

Peripherals

U601A PTRF6150 PG3.0

Vbat3 Reg 3   Vreg3 62   VRF3
Vbat2 Reg 2   Vreg2 7   VRF2
Vbat1 Reg 1   Vreg1 49

VR2B

C638 n.m

VR4in

LNA/TX offset mixer - Vcc2
Demod / PA Ctrl - Vcc3
RX Buf / TX PFD - Vcc4
TX CP - Vcc6
Main VCO core - Vcc8
RX BB / VCO Buf - Vcc1
Main CP - Vcc7
AUX VCO - Vcc5
AUX PLL / 13Mhz - Vcc9
Main Counters - Vcc10

Bandgap
BIASref

VRF1

C649 4U7-X5R   C650 4U7-X5R   C651 4U7-X5R

CLK   DATA   EN   /RESET_RF

R628A   R628B   R628C   R628D
MNR04-1k

CLK
DATA
EN
ResetZ

QN
QP
IN
IP

QN I/Q
QP
IN RX &
IP TX

C642 n.m   C643 1p   C644 5p6   C641 1n   C645 10n   C648 10n   C647 n.m   C646 27p

TP601 TP602   TP604 TP603

GND

RADIO_TEMP

R632 0402-R-Short

C639 n.m   R627 9k76 1%   C640 100n

TO/FROM BASEBAND

VR2B
CLK
DATA
EN
/RESET_RF
QN
QP
IN
IP

TX_ON
PA_LEVEL
VBAT
/PA_ON1800
/PA_ON900

LITEON   Lite-On Technology Corp.

Title: B1300 Clara RF

Size A2   Document Number <Doc>   Rev 2.2

Date: Monday, January 27, 2003   Sheet 1 of 1

Chapter 9. Tooling List

Level 1

ITEM	FUNCTION	SPEC
MAGANIFY(20 TIME)		Motic 20x~80
DOUBLE TAPY (3M)		8*22 mm
TAPE CUTER MACHINE		ELM
PINCES	Pick up small part	3C
SCREW DRIVE	Screwing	HIOS CL3000
ELIMINATOR AIR GUN	Clean lens	3M Model 908
LONG FIBER CLOTH	Clean hand set	15*15 CM
DUMMY BATTERY	For testing	
TEST SIM CARD		
ANTISTATIC GLOVE		
ESD COMPONENT BOX (SMALL)		
ESD COMPONENT BOX (BIG)		
ESD WRIST STRIP		
ESD TRAY		
ANTISTATIC TABLE CLOTH		
SCREW FEEDER		
HAND SCREW DRIVE		

Level 2

ITEM	FUNCTION	SPEC
Buzzer/Mic Replace		
LED Replace		
Murcury Battery Replace		
SOLDER STATION		Weller WES50
SOLDER WIRE		Kester 0.6mm
FLUX PASTE		Fmkanc32-200
MAGANIFY(20 TIME)		Motic 20x~80x
DOUBLE TAPY (3M)		8*22 mm
TAPE CUTER MACHINE		ELM
PINCES	Pick up small part	3C
SCREW DRIVE	Screwing	HIOS CL3000
ELIMINATOR AIR GUN	Clean lens	3M Model 908
LONG FIBER CLOTH	Clean hand set	15*15 CM
DUMMY BATTERY	For testing	
PRINTER		
SCANNER		
PC		
TEST SIM CARD		
ANTISTATIC CLOTH		
ANTISTATIC GLOVE		
ANTISTATIC SHOES		
ESD COMPONENT BOX (SMALL)		
ESD COMPONENT BOX (BIG)		
CLEANNER		
CLEANNER BOTTLE		
ESD WRIST STRIP		
ESD TRAY		
ANTISTATIC TABLE CLOTH		
SCREW FEEDER		
SOLDER IRON JIG		
HAND SCREW DRIVE`		

Level 3

ITEM	FUNCTION	SPEC
Buzzer/Mic Replace		
LED Replace		
Murcury Battery Replace		
SOLDER STATION		Weller WES50
SOLDER WIRE		Kester 0.6mm
FLUX PASTE		Fmkanc32-200
MAGANIFY(20 TIME)		Motic 20x~80x
DOUBLE TAPY (3M)		8*22 mm
TAPE CUTER MACHINE		ELM
PINCES	Pick up small part	3C
SCREW DRIVE	Screwing	HIOS CL3000
ELIMINATOR AIR GUN	Clean lens	3M Model 908
LONG FIBER CLOTH	Clean hand set	15*15 CM
DUMMY BATTERY	For testing	
PRINTER		
SCANNER		
PC		
TEST SIM CARD		
ANTISTATIC CLOTH		
ANTISTATIC GLOVE		
ANTISTATIC SHOES		
ESD COMPONENT BOX (SMALL)		
ESD COMPONENT BOX (BIG)		
CLEANNER		
CLEANNER BOTTLE		
ESD WRIST STRIP		
ESD TRAY		
ANTISTATIC TABLE CLOTH		
SCREW FEEDER		
SOLDER IRON JIG		
HAND SCREW DRIVE`		

Chapter 10. Equipment List

Level 2

ITEM	FUNCTION	SPEC
PC		
Dummy Battery		
Multimeter		
OSC SCOPE		
SPECTRUM		

Level 3

ITEM	FUNCTION	SPEC
HP 8960/HP 8922/R&S CMU200		
HP 66311B (DC Power)		
PC		
GPIB Card (HP82350A)		
Dummy Battery		
Multimeter		
OSC SCOPE		
SPECTRUM		
HP E6392B		

Chapter 11. Exploded View & Replacement Part List

11.1 Exploded View

NO.	TITEL	PART NO.	Q'TY	REMARK
18	EAR-MIC CAP		1	
17	SCREW M1.6×3	R3220070U0	4	T=1.0kgf-cm
16	VIBRATOR	R400001180	1	
15	MIC	HJ110028T0	1	
14	METAL DOME	R401000810	1	
13	KEYPAD	R392008110	1	

NO.	TITEL	PART NO.	Q'TY	REMARK
12	BATTERY COVER	R2770040R0	1	
11	BATTERY PACK		1	
10	RF CAP	R3814030J0	1	
9	REAR CASE	R2720244R0	1	
8	BATT. CONNECTOR	R3010218M0	1	
7	EMBEDDED ANT.	R3930047M0	1	
6	PCB ASSM.		1	
5	LCM METAL SHEET	R3850037Q0	1	
4	SPEAKER	HJ001190M0	1	
3	FRONT CASE	R2710338R0	1	
2	LENS	R3870192R0	1	
1	BEZEL	R2920002A0	1	

光寶科技股份有限公司 LITEON CORPORATION

DIM.	TOL.
1~6	±0.10
6~30	±0.15
30~100	±0.20

PROJECT	B1300
FILENAME	B1300-EXPLODE-PT02
PARTNAME	B1300-EXPLODE
PART NO.	

APPROVED	
CHECKED	
DESIGNER	TADDY_LIN
DRAWING	TADDY_LIN

SIZE	A3
SCALE	1:1
UNITS	MM
DATE	03/03/'03

FINISH	
MATERIAL	
SHEET	1/1
VERSION	PT02

DESIGN CHANGE NOTES

NO.	DESCRIPTION	DATE	CONF.

<Parts List of Exploded View>

No.	Location No.	LG Part No.	GVC Part No.	Description	Service
M1		MDAL0002501	R2920002A0	B1300 bezel for LG	Y
M2		MWAZ0002901	R3870192R0	B1300 LENS FOR LG	Y
M3		MCJK0017802	R2710338R0	B1300 Front Case (SV)	Y
M4	LS301(BRS-241302P)	SUSY0009201	HJ001190M0	Speaker & Receiver BRS-241302P	Y
M5		MHGD0001701	R3850037Q0	LCM METAL SHEET1 0.2t	Y
M6		SAFY0078401	8404C699	Main Board + Keypad	Y
M7		SNGF0002201	R3930047M0	ANTENNA EMBEDED(IN BUILD ANTENNA)	Y
M8	J103	ENZY0012801	R3010218M0	Battery connector C07-105-0029	Y
M9		ACGM0022802	R2720244R0	B1300 Rear Case Assembly (SV)	Y
M10		MCCF0010801	R3814030J0	B1300 RUBBER CAP FOR ANTENNA	Y
M11		SBPL0064501	JB040094A0	BATTERY PACK,LI-ION	Y
M12		MCJA0004502	R2770040R0	B1300 Battery Cover (SV)	Y
M13		MKAA0008401	R392008110	B1300 P+R KEYPAD (Russia)	Y
M14		ADCA0013701	R401000810	B1300 METAL DOME	Y
M15	M301	SUMY0006601	HJ11006590	MICRO PHONE OB-22S42-C1033 with Polymatech	Y
M16	J301 (LA4-436BB1)	SJMY0005701	R400001180	Vibrator 3V 11200rpm LA4-436BB1	Y
M17		GMZZ0009501	R3220072U0	MACHINE SCREW M1.6x3mm T6	Y
M18		MCCC0010101	R3814033J0	B1300 RUBBER CAP FOR EAR-MIC	Y

11-2 Replacement Part List

No.	Location No.	LG Part No.	GVC Part No.	Description	Service
Chip set					
	U201		CG010288B0	ASIC ULYSSE Hercrom200 DBBµBGA_179p	N
	U202		CG010438B0	ASIC Nausica_CS TWL3012GGM ABB µBGA_100p	N
	U601		CG01042DB0	IC ASIC Clara Transceiver TRF6150 S-PQFP-G64 Re3.1	N

Item	Location No.	LG Part No.	GVC Part No.	Description	Service
Memory					
	U303		BB31911Y80	SRAM IC CHD416LVB-70 BGA 48P	N
	U304		BG16907YT0	Flash Memory IC 32Mbit dual-bank AM29DL323GT90WMI	N

Item	Location No.	LG Part No.	GVC Part No.	Description	Service
Electronic - Baseband Active					
	U302	#N/A	DA01043Y30	IC Audio Amplifier TPA751DGN S-PDSO-G8	N
	Q101		DE04096YD0	IC MOSFET+Schottky Diode Si4833DY SO-8 Vishay Siliconix	N
	Q301	EQBN0013601	EAE1000340	TR NPN Pair IMX9 SMT6	Y
	Q302	EQBP0007601	EBE1000240	TR PNP Pair IMT17 SMT6	Y
	D201	EDSY0011501	EJ12005840	Schottky Diode RB751S-40 SOD523	Y
	D313	EDSY0011601	EJE1001640	Diode Pair DA221 SOT416	Y
	D301,D302,D303,D304, D307,D308	EDLH0008901	EL500290D0	LED 0816 BL-HB536E-TRB Blue	Y
	D309,D310,D311,D312	EDLH0009001	EL500289D0	LED 0622 BL-HB334E-TRB Blue	Y
	Y201	EXXY0016101	EM432762T0	X'TAL 32.768KHZ MS1V-TK 20PPM 12.5PF SMD 2P	Y
	D101,D104	#N/A	HH000010X0	ESD Protection P0402FC08C P0402FC	N

Item	Location No.	LG Part No.	GVC Part No.	Description	Service
Electronic - RF Active					
	U602		CG31028YR0	IC Front End Module FEM8450T	N
	U603	EUSY0138203	DA01048YT0	IC Power Amplifier RF3110	Y
	U604		DE04099Y30	IC INVERTOR SN74AHC1GU04DCKR SOT353 TI	N
	Z601		DE04103YZ0	IC BALUN LDB32920M05D-463	N
	Q602	EQBN0015101	EA95857850	TR NPN 2SC5010-T1	Y
	Q603	EQBP0007401	EB95001840	TR PNP DTA114YE EMT3	Y
	Q601	EQFP0004001	EGE10002T0	Dual P-Channel 1.8V MOSFET Si1905DL SOT363	Y
	D601,D602	EDVY0001601	EJE10018I0	Variable Capacitance Diode for VCO HVC369B	Y
	Y601	EXSC0005501	EMA0001410	VCO VON1885C28DKB	Y
	Y602	EXSK0003301	EN913003L0	VCTCXO 13MHz TOA1300VPM4DKG-SM2	Y

		Electronic - Passive			
Item	Location No.	LG Part No.	GVC Part No.	Description	Service
	R106,R302,R361,R362,R363		FM21000010	CHIP RES 1/16W 5% 0ohm 1005	N
	R107,R108,R114,R354		FM210479X0	CHIP RES 1/16W 5% 4.7ohm 1005	N
	R616,R618		FM210689X0	CHIP RES 1/16W 5% 6.8ohm 1005	N
	R327		FM01010010	CHIP RES 1/10W 5% 10ohm 1608	N
	R631,R633,R320,R321,R322,R323		FM210150X0	CHIP RES 1/16W 5% 15ohm 1005	N
	R310		FM01068910	CHIP RES 1/10W 5% 6.8ohm 0603	N
	R605		FM01022210	CHIP RES 1/10W 5% 2.2K 1608	N
	R609,R610		FM21033010	CHIP RES 1/16W 5% 33ohm 1005	N
	R110,R319,R353		FM210470X0	CHIP RES 1/16W 5% 47ohm 1005	N
	R318		FM00056010	CHIP RES 1/8W 5% 56ohm 2012	N
	R638		FM210680X0	CHIP RES 1/16W 5% 68ohm 1005	N
	R607		FM210820X0	CHIP RES 1/16W 5% 82ohm 1005	N
	R637,R314		FM21010110	CHIP RES 1/16W 5% 100ohm 1005	N
	R601		FM210221X0	CHIP RES 1/16W 5% 220ohm 1005	N
	R216,R329,R330,R331,R332,R333,R334		FM21027110	CHIP RES 1/16W 5% 270ohm 1005	N
	R630		FM210561X0	CHIP RES 1/16W 5% 560ohm 1005	N
	R603,R308		FM210681X0	CHIP RES 1/16W 5% 680ohm 1005	N
	R338,R339,R640,R352		FM21010210	CHIP RES 1/16W 5% 1K 1005	N
	R602,R613		FM210122X0	CHIP RES 1/16W 5% 1.2K 1005	N
	R614		FM210152X0	CHIP RES 1/16W 5% 1.5K 1005	N
	R606		FM210182X0	CHIP RES 1/16W 5% 1.8K 1005	N
	R355,R604		FM210222X0	CHIP RES 1/16W 5% 2.2K 1005	N
	R634		FM21027210	CHIP RES 1/16W 5% 2.7K 1005	N
	R301,R608,R317		FM210332X0	CHIP RES 1/16W 5% 3.3K 1005	N
	R304,R325,R316		FM21047210	CHIP RES 1/16W 5% 4.7k 1005	N
	R619		FM21068210	CHIP RES 1/16W 5% 6.8K 1005	N
	R306,R326		FM21091210	CHIP RES 1/16W 5% 9.1K 1005	N
	R115,R209,R211,R315,R217,R212		FM210103X0	CHIP RES 1/16W 5% 10K 1005	N
	R102,R204		FM210203X0	CHIP RES 1/16W 5% 20K 1005	N
	R207		FM210224X0	CHIP RES 1/16W 5% 220K 1005	N
	R624,R625		FM210473X0	CHIP RES 1/16W 5% 47K 1005	N
	R111,R206,R335		FM210104X0	CHIP RES 1/16W 5% 100K 1005	N
	R208,R351,R356,R357		FM210124X0	CHIP RES 1/16W 5% 120K 1005	N
	R629		FM210105X0	CHIP RES 1/16W 5% 1M 1005	N
	R627		FN219761X0	CHIP RES 1/16W 1% 9.76K 1005	N
	R101		FN900228X0	CHIP RES 1/4W 1% 0.22ohm 2012	N

Item	Location No.	LG Part No.	GVC Part No.	Description	Service
	R103		FP911024X0	CHIP RES ARRAY 1/16W 5% 1Kohm 4P2R MNR02	N
	R210,R215,R628		FP911025X0	CHIP RES ARRAY 1/16W 5% 1K 8P4R MNR04	N
	R109		FP91104510	CHIP RES ARRAY 1/16W 5% 100Kohm 8P4R MNR04	N
	R104,R105		FP914705X0	CHIP RES ARRAY 1/16W 5% 47ohm 8P4R MNR04	N
	R311,R312,R313		FP911015X0	CHIP RES ARRAY 1/16W 5% 100ohm 8P4R MNR04	N
	R615,R617		FP916814X0	CHIP RES ARRAY 1/16W 5% 680ohm 4P2R MNR02	N
	VR113,VR301,VR307, VR310,C335,VR101,VR102,VR103,VR104,VR105,VR106,VR107,VR108,VR109,VR110,VR111,VR112,C351,C352		FR00000130	VARISTOR VPORT0402 220K	N
	C610		GH022252P0	CHIP FILM 2012 2.2n/50V J 5%	N
	C604		GH047222P0	CHIP FILM 2012 4.7n/16V JN	N
	C613		GM01025270	CHIP MONO 2012 1n/50V JN	N
	C103,C208,C319,C320,C321,C322,C323,C324,C325,C326,C327,C329		GM41056370	CHIP MONO 1608 1u/16V K/X5R	N
	~~C103,C208,C319,C320,C321,C322,C323,C324,C325,C326,C327,C329~~		~~GM410523J0~~	~~CHIP MONO 1608 1u/16V K~~	N
	C224,C654		GM02251H70	CHIP MONO 2012 2.2u/10V MX	N
	C631,C649,C650,C651		GM04751K70	CHIP MONO 2012 4.7u/10V KR	N
	C612		GH112322P0	CHIP FILM 3216 12n/16V J 5%	N
	C611		GH115322P0	CHIP FILM 3216 15n/16V J5%	N
	C603		GH133322P0	CHIP FILM 3216 33n/16V J 5%	N
	C106,C113,C223,C225,C226,C227,C353,C101,C360,C361		GM01060Z70	CHIP MONO 2012 10u/6.3V M/X5R	N
	C602		GM41025270	CHIP MONO 1608 0.001u/50V J	N
	C104		GM41042370	CHIP MONO 1608 0.1u/16V KX	N
	C207		GM42241370	CHIP MONO 1608 0.22u/10V K/X7R	N
	C643,C671		GM60105B70	CHIP MONO 1005 1p/50V CN	N
	C622,C623		GM62795B70	CHIP MONO 1005 2.7p/50V CN	N
	C607		GM63395270	CHIP MONO 1005 3.3p/50V JN	N
	C606		GM63995270	CHIP MONO 1005 3.9p/50V JN	N
	C632		GM60505B70	CHIP MONO 1005 5p/50V CN	N
	C601,C644		GM65695270	CHIP MONO 1005 5.6p/50V JN	N
	L608		HB11014940	INDUCTOR CHIP 1005 2.7nH ±0.3	N
	C660		GM66895270	CHIP MONO 1005 6.8p/50V JN	N
	C626,C627,C629,C634		GM61205270	CHIP MONO 1005 12P/50V JN +/- 5%, NPO	N
	C203,C204,C205		GM61805270	CHIP MONO 1005 18p/50V JN	N
	C105,C636		GM62205270	CHIP MONO 1005 22p/50V JN	N

Item	Location No.	LG Part No.	GVC Part No.	Description	Service
	C605,C617,C621,C646,C668		GM62705270	CHIP MONO 1005 27p/50V JN	N
	C657,C658		GM63302270	CHIP MONO 1005 33p/50V JN	N
	C110,C111,C112,C114,C228,C231,C232,C301,C313,C330,C331,C332,C333,C334,C337,C338,C341,C355,C628,C633,C309,C310,C311,C312,C356,C357		GM64705270	CHIP MONO 1005 47p/50V JN	N
	C609		GM66805270	CHIP MONO 1005 68p/50V JN	N
	C614		GM61015270	CHIP MONO 1005 100p/50V JN	N
	C665		GM61215270	CHIP MONO 1005 120p/50V JN	N
	C209,C210		GM64715370	CHIP MONO 1005 470P/50V KX +/- 10%, X7R	N
	C314,C663		GM66815370	CHIP MONO 1005 680p/50V KX	N
	C212,C619,C620,C645,C652,C653		GM61025370	CHIP MONO 1005 0.001u/50V KX	N
	C308		GM63925370	CHIP MONO 1005 3.9nF/50V JN	N
	C648,C362		GM61032370	CHIP MONO 1005 0.01u/16V KX +/- 10%, X7R	N
	C102		GM62232370	CHIP MONO 1005 0.022u/16V KX	N
	C211		GM63331370	CHIP MONO 33n/10v K/X7R 1005	N
	C107,C206,C213,C214,C215,C216,C217,C218,C219,C220,C221,C222,C304,C305,C316,C608,C640,C662,C664		GM61041370	CHIP MONO 1005 0.1u/10V K X5R	N
	C306,C307,C339,C656		GM61050870	CHIP MONO 1005 1u/6.3V ZY	N
	L604,L605		HB11030440	CHIP INDUCTOR 1005 1.8nH 300mA +/- 0.3nH	N
	L601		HB110331U0	CHIP INDCTOR 1005 2.7nH +/-0.1nH 220mA FILM TYPE	N
	L614		HB11001040	CHIP INDUCTOR 1005 6.8nH 300mA 10%	N
	L606,L607		HB11028940	CHIP INDUCTOR 1005 10nH 250mA 10%	N
	L612		HB11029140	CHIP INDUCTOR 1005 22nH 250mA 10%	N
	L602,L603		HB11031340	CHIP INDUCTOR 1005 120nH 250mA 10%	N
	L613		HB11033040	CHIP INDUCTOR 1005 100nH 100mA +/-5%	N
	L609		HB110335U0	CHIP INDUCTOR SMD 1608 15nH +/-2% 150mA FILM TYPE	N

LG Electronics

	ELECTRO-MECH				
Item	Location No.	LG Part No.	GVC Part No.	Description	Service
	B201	SBCL0001103	JB040124V0	BACKUP BATTERY 3.3V 6.8*2.1 MS621F FL11N	Y
M4	LS301(BRS-241302P)	SUSY0009201	HJ001190M0	Speaker & Receiver BRS-241302P	Y
M15	M301	SUMY0006601	HJ11006590	MICRO PHONE OB-22S42-C1033 with Polymatech	Y
	DS301	SVLM0006101	JG100140U0	LCD MODULE FSTN 28P	Y
	J600	ENWY0002501	R301016960	RF MECHANICAL CONNECTOR MS-147	Y
	J102	ENSY0008301	R3010204F0	SIM CONNECTOR 11.7x7.5x2.0 ASB06E-A0G15	Y
M8	J103	ENZY0012801	R3010218M0	Battery connector C07-105-0029	Y
	J104 (GT051-18P-LSS-SB-NB)	ENEY0003101	R3010274P0	Connector 0.5mm 18pin GT051-18P-LSS-LB-NB	Y
	CN301	ENJE0003601	R3950068I0	EARPHONE Jack LGK1709-1601	Y
M16	J301 (LA4-436BB1)	SJMY0005701	R400001180	Vibrator 3V 11200rpm LA4-436BB1	Y
			R401A011S0	Meatl CAN RF A316	N
		SSAD0007903	JB100159E0	B1300 Travel Adapter	Y

	PCB				
Item	Location No.	LG Part No.	GVC Part No.	Description	Service
	PCB 6 LAYER		KG10320000	BOARD B1300 103mmx39mmx6 Layer	N

	Mechanics				
Item	Location No.	LG Part No.	GVC Part No.	Description	Service
		MCJK0017801	R2710387R0	B1300 Front Case (CO)	Y
M3		MCJK0017802	R2710338R0	B1300 Front Case (SV)	Y
M1		MDAL0002501	R2920002A0	B1300 bezel for LG	Y
M2		MWAZ0002901	R3870192R0	B1300 LENS FOR LG	Y
		ACGM0022801	R2720271R0	B1300 Rear Case Assembly (CO)	Y
M9		ACGM0022802	R2720244R0	B1300 Rear Case Assembly (SV)	Y
		MCJA0004501	R2770047R0	B1300 Battery Cover (CO)	Y
M12		MCJA0004502	R2770040R0	B1300 Battery Cover (SV)	Y
M14		ADCA0013701	R401000810	B1300 METAL DOME	Y
M13		MKAA0008401	R392008110	B1300 P+R KEYPAD (Russia)	Y
M17		GMZZ0009501	R3220072U0	MACHINE SCREW M1.6x3mm T6	Y
M7		SNGF0002201	R3930047M0	ANTENNA EMBEDED(IN BUILD ANTENNA)	Y
M10		MCCF0010801	R3814030J0	B1300 RUBBER CAP FOR ANTENNA	Y
M5		MHGD0001701	R3850037Q0	LCM METAL SHEET1 0.2t	Y
		MPBZ0027701	R3630113G0	B1300 Sponge for backup battery	Y
M18		MCCC0010101	R3814033J0	B1300 RUBBER CAP FOR EAR-MIC	Y

	PCBA				
Item	Location No.	LG Part No.	GVC Part No.	Description	Service
M6		SAFY0078401	8404C699	Main Board + Keypad	Y

LITE-ON Technology Corp.

PEPAIR ORDER / JOB SHEET

Customer :	CONTACTPHONE NO.:
	MODEL NO. ：
CONTACTPHONE NO :	MSN NO. ：
	IMEI NO. ：

INSPECTION ITEM
☐ LABEL   ☐ WARRANTY   ☐ Re-send

EQUIPMENT RECEIVED
☐ ANT.   ☐ ANT CAP   ☐ Battery   ☐ Gold-card   ☐ User-card

COMPLAINT

☐ NO ON/OFF	☐ POOR RECEPTION	☐ NOISY
☐ WATER-DAMAGED	☐ DROP-DAMAGED	☐ DROPPED CALL
☐ NO Tx/Rx	☐ NO IN/OUT	☐ NO SVC
☐ NO CHARGE	☐ KEYPAD	☐ DISPLAY
☐ VIBRATOR	☐ CHECK CARD/INSERT CARD	☐ NOISY

SUBMITTED BY :   DATE :   RECEIVED BY :   DATE :

Failure / Cause	Repair Component	Duration	Comp. Fee	Engineer	Date

QUOTATION :   ☐ YES   ☐ NO

INVOICE NO	AMOUNT	VAT	TOTAL

APPROVED BY : _____ CONFIRMED WORK DONE/RECEIVED

BY : _____

4 Copies :   (1. User   2. Level 1   3. Level 2   4. Level 3)